THE JOURNAL OF GAS LIGHTING
WATER SUPPLY & SANITARY IMPROVEMENT

VOL. LXIX. No. 1761.] LONDON, FEBRUARY 9, 1897. [49TH YEAR. PRICE 6d.

TUBES AND FITTINGS
FOR
GAS, STEAM, WATER,
AND ALL PURPOSES,
ALSO
COILS OF EVERY SIZE AND SHAPE.

Apply to the Original Firm of
JOHN BROTHERTON
LIMITED,
Imperial Tube Works, Monmore Green,
WOLVERHAMPTON.
ESTABLISHED 1861.

Lanemark Coal Co.,
LIMITED.
LANEMARK CANNEL AND GAS COALS.
Quotations and Analysis on Application to
LANEMARK COLLIERY,
NEW CUMNOCK, N.B.
Shipping Ports: All the principal Scotch Ports.

— ESTABLISHED 1830. —
PARKER & LESTER,
Manufacturers & Contractors.
THE ONLY MAKERS OF
PATENT ANTIMONY PAINT,
Parker's Imperial Black Varnish,
Oxide Paints, Oils, and General Stores, for Gas and Water Works.
WORKS:
ORMSIDE STREET, OLD KENT ROAD,
LONDON.

'BEAR CREEK' CANNEL
LOG MOUNTAIN COAL, COKE, AND TIMBER CO.
PINEVILLE, KENTUCKY, U.S.A.
Cable Address:
"HULL, PINEVILLE." Codes used "ABC" & "A1."
Communications to the Company only.

NORTON'S PATENT
"ABYSSINIAN" & ARTESIAN TUBE WELLS,
FOR TOWN WATER-WORKS AND OTHER SUPPLIES.
The following Town Water-Works Supplies have been obtained by this System, viz.:—Abbott's Langley, Aldershot, Alnwick, Cirencester, Hertford, Lechlade, St. Albans, Shrewsbury, Skegness, Southampton, Stony Stratford, Swansea, Wallingford, Watford, West Worthing, Wimborne, &c.
LE GRAND & SUTCLIFF,
HYDRAULIC ENGINEERS, 100, BUNHILL ROW, LONDON, E.C.

4,444
"MELDRUM" FURNACES
MADE TO DECEMBER 16th, 1896.
No Gas-Works should be without. WRITE FOR CATALOGUE & TESTIMONIALS.
MELDRUM BROS., ATLANTIC WORKS, **MANCHESTER,**
Also at London, Leeds, Birmingham, Liverpool, Newcastle, and Glasgow.

DANIEL HOWARD,

(Successor to the late BENJ. WHITEHOUSE),

GASHOLDER & BOILER WORKS,

WEST BROMWICH, NEAR BIRMINGHAM

(ESTABLISHED 1765).

MANUFACTURER OF TELESCOPIC AND SINGLE GASHOLDERS,

WROUGHT AND CAST IRON TANKS FOR DITTO,

PURIFIERS, CONDENSERS, SCRUBBERS, HYDRAULIC MAINS, and all kinds of GAS APPARATUS,

Wrought-Iron Roofs, Bridges, Girders, &c.,

Steam, Hot Water, and Range Boilers, Tanks, Cisterns, Boats, and all kinds of Wrought-Iron Work.

DRAWINGS, SPECIFICATIONS, AND ESTIMATES SUPPLIED ON APPLICATION.

TELEGRAPHIC ADDRESS: "COCKEY'S FROME."

EDWARD COCKEY & SONS, Ld.,

ESTABLISHED OVER HALF A CENTURY.

Gas Engineers and Contractors for the Erection of Gas-Works,

MANUFACTURERS OF IMPROVED GAS-EXHAUSTING APPARATUS, AND OF FISH AND SMITH'S PATENT (NO. 5108) OVERFLOW FOR REGULATING THE SEAL IN GAS-WASHERS, &c.

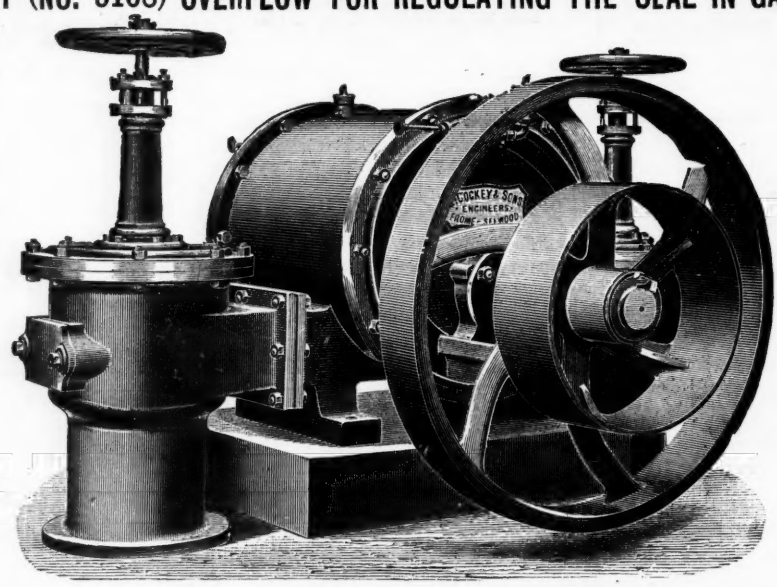
A Large Stock of Valves always on hand.

Lamp Columns; various patterns.

Wood Grids for Purifiers and Scrubbers.

Castings of every description.

Apparatus for the manufacture of Sulphate of Ammonia.



Experienced Retort-Setters constantly employed.

Lead Burning and Plumbing in all its Branches.

Gas-Fittings in great variety.

Brass Castings.

Patent Washers and Valves.

Boilers and Engines.

THE IRON-WORKS, FROME SELWOOD, SOMERSET.

London Office: BRIDGE HOUSE, 181, QUEEN VICTORIA STREET, E.C. *BALE AND HARDY, Agents.*

HIGHEST AWARDS—LONDON, PARIS, COLOGNE, VIENNA, MELBOURNE, AND OTHERS.

—11 MEDALS.—

MANUFACTURERS OF TUBES AND FITTINGS OF EVERY DESCRIPTION.

WROUGHT-IRON OR STEEL MAINS UP TO 6 FEET DIAMETER, FOR GAS, WATER, OIL, OR OTHER PURPOSES.

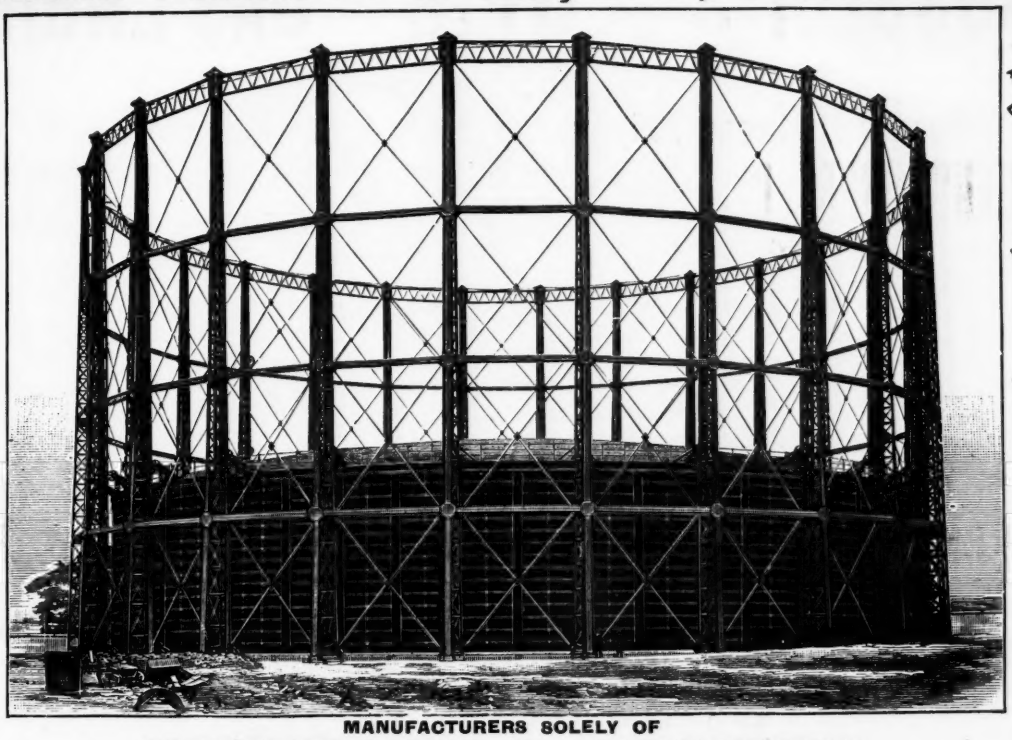
SCREWING TACKLE, BOILER MOUNTINGS, VALVES, COCKS, ETC.

LONDON: 103, Southwark Street. MANCHESTER: 33, King Street West. BIRMINGHAM: 114, Colmore Row. LEEDS: 6, Mark Lane, New Briggate.

THOMAS PIGGOTT & CO., LTD., BIRMINGHAM.

LONDON OFFICE: ST. THOMAS APOSTLE, E.C.

GAS PLANTS, BOILERS, ENGINES, PUMPS, ROOFS, RETORT-FITTINGS, ETC.



TELEGRAPHIC ADDRESS: ATLAS BIRMINGHAM

WELDED & RIVETED PIPES, FOUL MAINS, RETORT-LIDS, WROT & CAST TANKS, PURIFIERS.

MANUFACTURERS SOLELY OF

HUMPHREYS & GLASGOW'S

PATENT CARBURETTED WATER-GAS PLANT.

INSTALLATIONS have already been supplied, and are in operation at the following Gas-Works: COPENHAGEN, BELFAST, GLASGOW, BRUSSELS, SANTIAGO, SWANSEA, TOTTENHAM, LIVERPOOL, BRIGHTON, BATH, PRESTON, SOUTHPORT, NEW YORK, NEWBURGH (N.Y.), NEWBURGH (Second Contract), HOYLAKE; and are in course of erection at: BELFAST (Second Contract), EDINBURGH, TOTTENHAM, WINCHESTER, MANCHESTER, BRUSSELS (Second Contract), ST. JOSEPH (MO.), HOLYOKE (MASS.), SHANGHAI, STOCKTON, STOCKPORT, NORWICH, GUILDFORD, SYRACUSE, BORDENTOWN, LEA BRIDGE, COVENTRY.

All Particulars from Patentees: 9, VICTORIA STREET, LONDON, S.W.

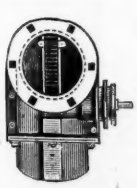
NEWTON, CHAMBERS, & CO., LIMITED,

THORNCLIFFE IRON-WORKS, near SHEFFIELD,

MANUFACTURERS OF

SLIDE VALVES, WITH RACK & PINION OR Internal or External SCREWS of all sizes.

GASHOLDERS, AND **Gasholder Tanks.**



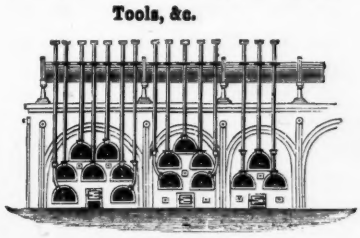
CAST-IRON RETORTS,

RETORT-BED FITTINGS,

And Retort-House Appliances

of every description,

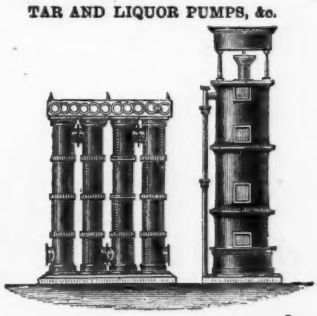
Iron Roofs, Columns, Girders, Floor Plates, Tools, &c.



WROUGHT AND CAST IRON

CONDENSERS, SCRUBBERS, & WASHERS,

TAR AND LIQUOR PUMPS, &c.



PATENT

CENTRE-VALVES

for working Purifiers,

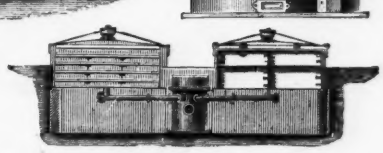
Also Bye-Pass & Stop Valves

PURIFIERS with Planed Joints,

HAND and HYDRAULIC LIFTING GEAR, CAST-IRON MAINS, and SPECIALS.

WOOD GRIDS.

CAST AND WROUGHT IRON TANKS AND CISTERNS.



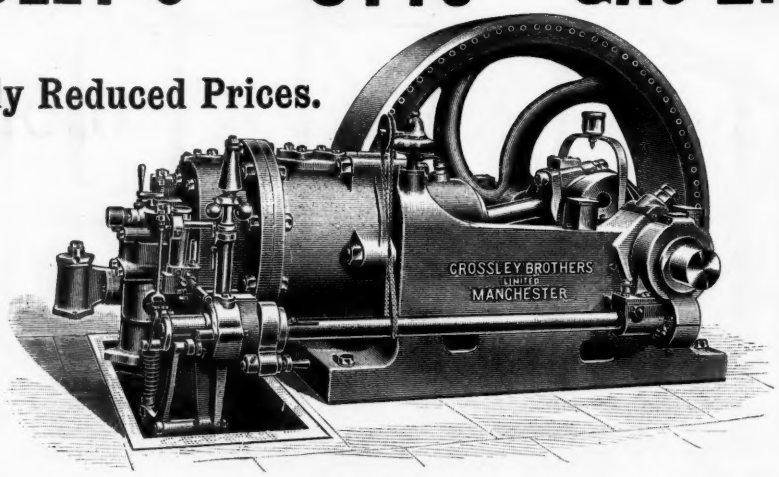
DESIGNS, SPECIFICATIONS, AND ESTIMATES FREE.

Pig Iron (*Special Quality*) for ENGINE CYLINDERS, &c.

GAS COAL FAMOUS FOR ITS UNRIVALLED EXCELLENCE.

CROSSLEY'S "OTTO" GAS-ENGINES

Greatly Reduced Prices.



REPRESENTS NEW TYPE 40-HORSE POWER NOMINAL HIGH-SPEED ELECTRIC-LIGHT ENGINE.

CROSSLEY BROS., LTD., OPENSHAW, MANCHESTER.

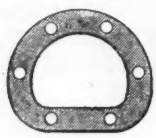
HARRIS & PEARSON,

STOURBRIDGE, ENGLAND

MANUFACTURERS OF

FIRE-CLAY GAS-RETORTS, FIRE-BRICKS, LUMPS, & TILES of Every Description.

GLAZED BRICKS AND PORCELAIN BATHS.



LARGEST MANUFACTURERS IN THE UNITED KINGDOM OF GAS-RETORTS,

HORIZONTAL or INCLINED; also Makers of SEGMENTAL RETORTS of all SECTIONS.

PATENTEES OF

MACHINE-FLANGED RETORTS

B. GIBBONS, JUNR., LTD.,

TELEPHONE No. 8010.

DIBDALE WORKS DUDLEY.

Telegraphic Address: "MACHINE, LOWER GORNAL"

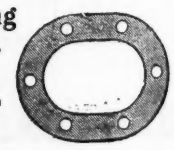
SPECIAL BRICKS and BLOCKS of every description for GENERATOR and REGENERATOR FURNACES.

"ABC" Code and UNICODE used for Telegrams and Cablegrams.

Large Stocks of Bricks of all sizes, Burrs, Boiler Seating Blocks and Covers, Plain and Rebated Tiles, &c., &c.

RETORTS and other FIRE-CLAY GOODS CAREFULLY PACKED for EXPORT.

FOREIGN and HOME COPIES of ILLUSTRATED CATALOGUES on Application.



EXCHANGE TELEPHONE: NO. 1756 BANK.

J. & H. ROBUS,

TELEGRAPHIC ADDRESS "ROBUSTNESS, LONDON."

ENGINEERS & CONTRACTORS,

20, BUCKLERSBURY, LONDON, E.C.

Complete Erection or otherwise.

Gasholders, Tanks, and Reservoirs of all sizes.

Gas and Water Main Laying a Speciality.

Retort Setting a "Speciality." Inclined or Horizontal Settings (with or without Regenerative or Generative Furnaces) of the most approved and Economical Designs.

ESTIMATES SUBMITTED FOR

Gas and Water Work of Every Description.

Contractors to H.M. Government.

For Retort Advertisement, see last week's "JOURNAL."

W. J. JENKINS & CO.

GAS ENGINEERS AND IRONFOUNDERS,

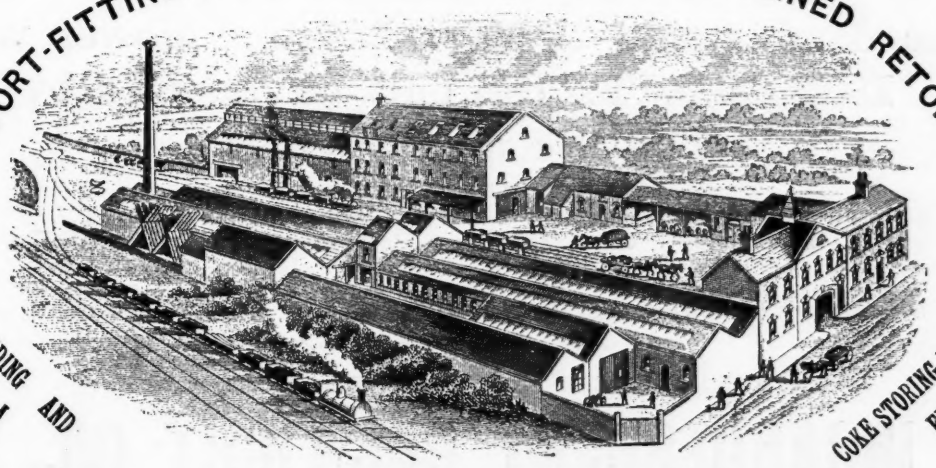
MAKERS OF ALL KINDS OF

PLANT AND MACHINERY FOR GAS-WORKS.

COAL-BREAKERS. COKE-SCREENS.

MOUTHPIECES. LIQUOR-TANKS.

RETORT-FITTINGS, REGENERATOR SETTINGS, INCLINED RETORTS.



COAL UNLOADING AND CONVEYING A SPECIALITY.

COKE STORING PLANT, ENGINES, EXHAUSTERS, VALVES.

BEEHIVE WORKS, **RETFORD,** NOTTS.

INCANDESCENT GAS-LIGHT

(WELSBACH PATENTS).

Important Notice.

Large Reduction in Prices From March 2, 1896, Due to Colossal Sales, And Universal Adoption of the System.

THE GREATLY REDUCED CONSUMPTION OF GAS
Covers the Initial Cost of the Burners in less than SIX Months.

The Prices have been REDUCED as follows:—

The Ordinary "C" Burner, price 6/6
The "C" Bye-Pass Burner, „ 7/6

Prices of other Patterns Reduced Proportionately.

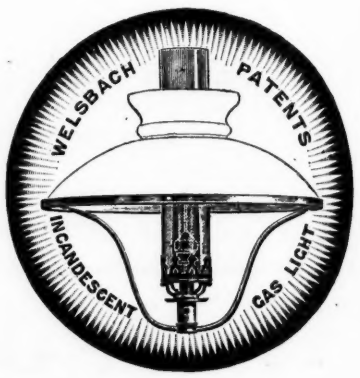
Special attention is called to

The "S" Bye-Pass Burner, price 7/6

which, with a consumption of 2¼ cubic feet of gas an hour, gives

A LIGHT OF 25 TO 30 CANDLE POWER.

This pattern is particularly recommended where it is desired to effect a large saving in gas rather than to effect a great increase in the light.



The attention of Gas Managers and Gas Engineers is called to this System of Lighting as one which tends to Popularize the Use of Gas as an Illuminant, owing to the following Advantages:—

Economy in Consumption of Gas, combined with High Illuminating Efficiency.
Freedom from Smoke, Dirt, and Flickering.
Greatly Reduced Heat.
The combination of High Lighting Power with DURABILITY can only be obtained by The Welsbach System.

The "Lancet" Special Analytical and Sanitary Commission, in an exhaustive report, pronounces the "Incandescent Gas-Light System" to be the **Healthiest, Best, and most Economical System of Gas Lighting.**

Suitable for every purpose of **Inside and Outside Lighting.**

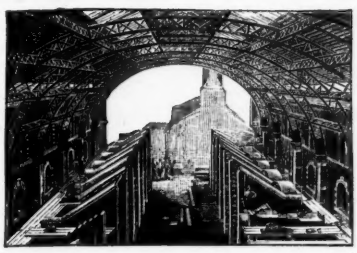
FOR FURTHER PARTICULARS, APPLY TO

THE INCANDESCENT GAS-LIGHT CO., LTD.,

Palmer Street, Westminster, London, S.W.

W. C. HOLMES & CO.

IRONFOUNDERS AND CONTRACTORS.

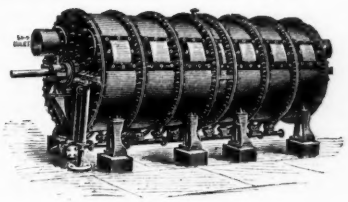


Makers of
GAS & CHEMICAL
PLANT.

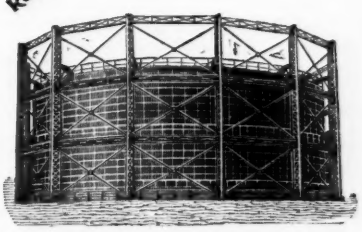
Telegrams:
"HOLMES, HUDDERSFIELD."

Improved
PATENT SCRUBBER-WASHERS,
All sizes,
From 50,000 to 5,000,000 Cubic Feet of Gas per day.
Results unrivalled. Send for Particulars and Prices.

MALLEABLE
and all Kinds of
CASTINGS.



GASHOLDERS of Improved Construction and of all Sizes.
ROOFS, BRIDGES, TANKS, GIRDERS.

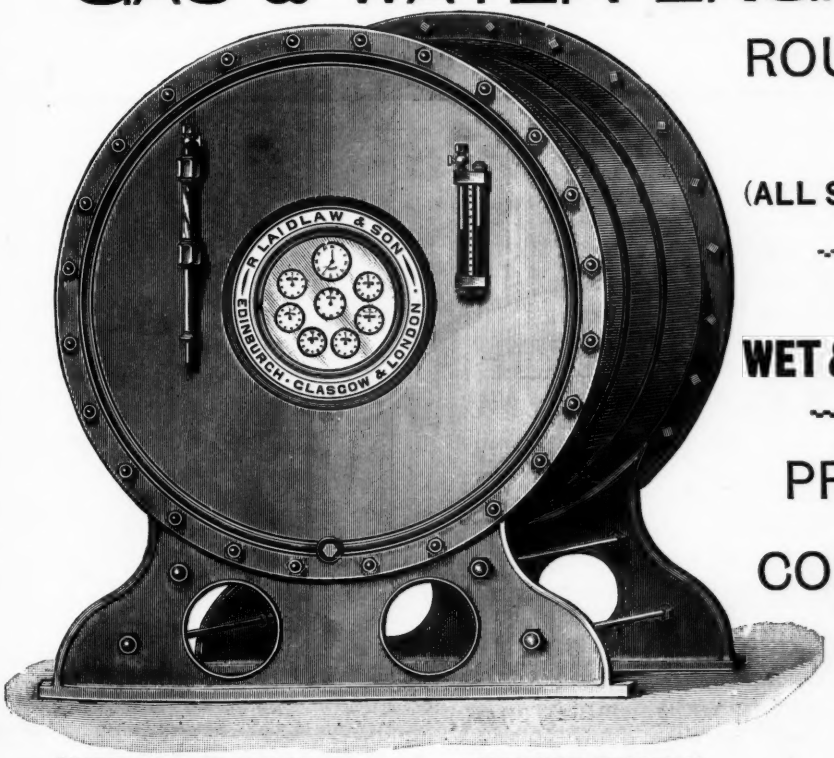


Improved
BYE-PASS and
CENTRE-VALVES,
GOVERNORS,
and METERS.

Rotary or Pump
EXHAUSTERS.

80, CANNON STREET, LONDON,
AND
WHITESTONE IRON WORKS, HUDDERSFIELD.

R. LAIDLAW & SON
GAS & WATER ENGINEERS.



ROUND OR SQUARE
STATION
(ALL SIZES) METERS.

CONSUMERS'
WET & DRY GAS-METERS.

PREPAYMENT
AND
COMPENSATING
METERS.

SIMON SQUARE WORKS, **EDINBURGH.** | ALLIANCE FOUNDRY, **GLASGOW.** | 6, LITTLE BUSH LANE, **LONDON, E.C.**

GAS COAL.

BEST
REAL OLD SILKSTONE GAS COAL,
Address THE STRAFFORD COLLIERIES COMPANY,
Near BARNSLEY, SOUTH YORKSHIRE.

JAMES MILNE & SON, LTD.,
GAS ENGINEERS,
MILTON HOUSE WORKS, EDINBURGH.
LONDON. — GLASGOW. — LEEDS.

R. & A. MAIN,
GAS COOKING AND HEATING STOVES,
92, ALDERSGATE STREET, KINNING PARK,
LONDON, E.C., & GLASGOW.

D. HULETT & CO., LTD.
55 & 56, High Holborn, London.

GAS SERVICE CLEANSERS.
LAMP TORCHES.

DRY GAS-METER MAKERS.

WROUGHT-IRON TUBES & FITTINGS.
STREET LAMPS & POSTS.

PRICE LISTS ON APPLICATION.

LONDON OFFICE
60, QUEEN VICTORIA ST. E.C.

TELEGRAPHIC ADDRESSES
"DRAKESON HALIFAX."
"ECLAIRAGE LONDON."

TELEPHONE No 43.
"HALIFAX EXCHANGE"

GAS ENGINEERS.
CONTRACTORS.
IRONFOUNDERS.

JONAS DRAKE & SON

SOLE AGENTS FOR
HISLOP'S
PATENT REGENERATIVE FURNACES
— FOR —
ENGLAND, WALES & ABROAD.
RETORT BENCHES ERECTED COMPLETE
WITH OR WITHOUT SPECIAL FURNACES.
RESULTS GUARANTEED.

OVENDEN HALIFAX

RETORT SETTERS.
FURNACE BUILDERS.
ETC. ETC.

Designs and Estimates on Application.

GASEOUS FIRING A SPECIALTY.

WILLEY & CO., GAS ENGINEERS,

CONTRACTORS TO THE GOVERNMENT,

LONDON & EXETER.

Offices: HAVEN ROAD, ST. THOMAS, EXETER.

Engineering Works & Brass Foundries: ST. THOMAS, EXETER.

Meter Factories & Works: JAMES STREET, EXETER; and 248, KINGSLAND ROAD, LONDON.

LATEST SPECIALITIES.

WATER-GAS APPARATUS—A Model Plant in course of erection at their Exeter Engineering Works. Continuous Process; the best Results yet attainable.

COLUMNLESS GASHOLDERS—Makers of Gadd & Mason's Patent System.

Agents for the **MAXIM CARBURETTOR.**

GAS ENRICHMENT in bulk or on Outlet Main.

Makers of the **LIVESEY WASHER.**

Manufacturers of **WET AND DRY GAS-METERS.**

Their Patent **PENNY-IN-THE-SLOT AUTOMATIC METER,** admittedly one of the most perfect in the Market. Thousands in use in London and the Provinces.

Manufacturers of **GAS-FITTINGS** in endless variety—**CHANDELIERS, BRACKETS, PENDANTS, MAIN COCKS, &c., &c., &c.** **SPECIAL FITTINGS** for the Automatic Business.

Metropolitan Agent:

FRANK ACLAND, M.Inst.C.E., M.Inst.M.E., 76, Cheapside, E.C.

Telegraphic Address: "WILLEY, EXETER." Telephone 132. Established over 30 Years.

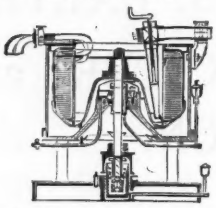
KIRKHAM, HULETT, & CHANDLER, LD.

3 & 4, PALACE CHAMBERS, BRIDGE STREET, WESTMINSTER, S.W.

MARSHALL'S PATENT COMBINED BATTERY CONDENSER AND SCRUBBER.

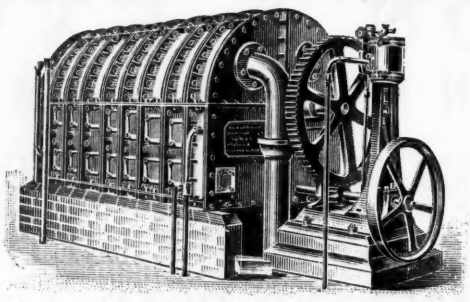
Extract from letter from Mr. Winstanley, of Coventry: 'The Condensers you erected for us have been in use some time, and are working very satisfactorily.'

BURMEISTER AND WAIN'S TAR-SEPARATOR.



EXTRACTS OVER 99 PER CENT. OF AMMONIACAL LIQUOR FROM TAR.

PATENT "STANDARD" WASHER-SCRUBBER.

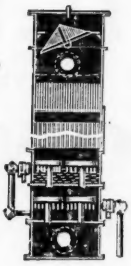


OVER 530 MACHINES

In use and in course of Construction.

They extract all the Ammonia and a large proportion of Carbonic Acid and Sulphuretted Hydrogen.

PATENT "STANDARD" VERTICAL SCRUBBER AND TAR-EXTRACTOR.



SUITABLE FOR SMALL WORKS WITHOUT AVAILABLE MOTIVE POWER FOR MECHANICAL WASHERS.

MARSHALL'S PATENT TAR EXTRACTOR AND WASHER.

Extract from letter from the Late Mr. Jabez Church: "The Marshall Patent Tar-Extractor has given very satisfactory results."

THE WIGAN COAL & IRON CO., LIMTD.,

Are exclusive Owners of the well-known HAIGH HALL & KIRKLESS HALL GAS COAL COLLIERIES, and supply the Best Wigan Arley Mine Gas Coal, Gas Nuts, Gas Cannel, Cannel Nuts, &c.

Midland District Office: PRINCE'S CHAMBERS, 6, CORPORATION STREET, BIRMINGHAM—Sole Agent: A. C. SCRIVENER.

TELEGRAPHIC ADDRESS: "WIGAN BIRMINGHAM." TELEPHONE No. 200.

London District Office: 6, STRAND, LONDON—C. PARKER & SON, Sole Agents.

TELEGRAPHIC ADDRESS: "PARKER LONDON."

THE

MAXIM PATENT CARBURETTOR

FOR ENRICHING GAS IN BULK.

Over 50 Maxim Patent Carburettors have now been fixed, capable of enriching

650,000,000

CUBIC FEET OF GAS PER DAY.

Among the Companies supplied are The Gaslight and Coke Company, the South Metropolitan Gas Company, Birmingham Corporation, Manchester Corporation, Rochdale Corporation, Bristol Gas Company, and many other Works, both large and small, where they have been working in some instances for the past **FOUR YEARS.**

More Gas and saleable Coke per ton of Coal Carbonized is produced; saving Capital, Labour, Fuel, Wear and Tear, &c.

The Enrichment is **INSTANTANEOUS** and **PERMANENT.**

The Carburettor is inexpensive, easily fixed, and entirely supersedes the use of Cannel.

SOLE AGENTS FOR REDWOOD & CLOWES' INFLAMMABLE VAPOUR & GAS DETECTORS.

Dealers in Carburine and all other Naphthas for the Enrichment of Gas.

FOR PRICES AND FULL PARTICULARS, APPLY TO

THE GAS LIGHTING IMPROVEMENT COMPANY, LIMITED,

18, DEVONSHIRE STREET, BISHOPSGATE, LONDON, E.C.

ARDEN HILL & CO.,

GAS ENGINEERS,

BIRMINGHAM.

No. 1080.

"THE ERA."

(Registered.)

A New Fire, with Circular Front, for this Season.

Has a perfect arrangement to utilize all Products of Combustion.

SPECIALLY MADE FOR HIRING-OUT PURPOSES.

No.	Height. Inches.	Width. Inches.	Width of Fire. Inches.	Price, Best Stove Enamel.
1080	29	20	8½	**50s.**
1082	30½	22½	10	**60s.**
1084	31½	25½	13	**70s.**

NOTE.—Prices include New Duplex Burner, Two Brass Lever Taps, and Fittings all complete, which can be had either right or left hand.

NICKEL PLATED TRIVETS . . . . . **2s.** EXTRA.

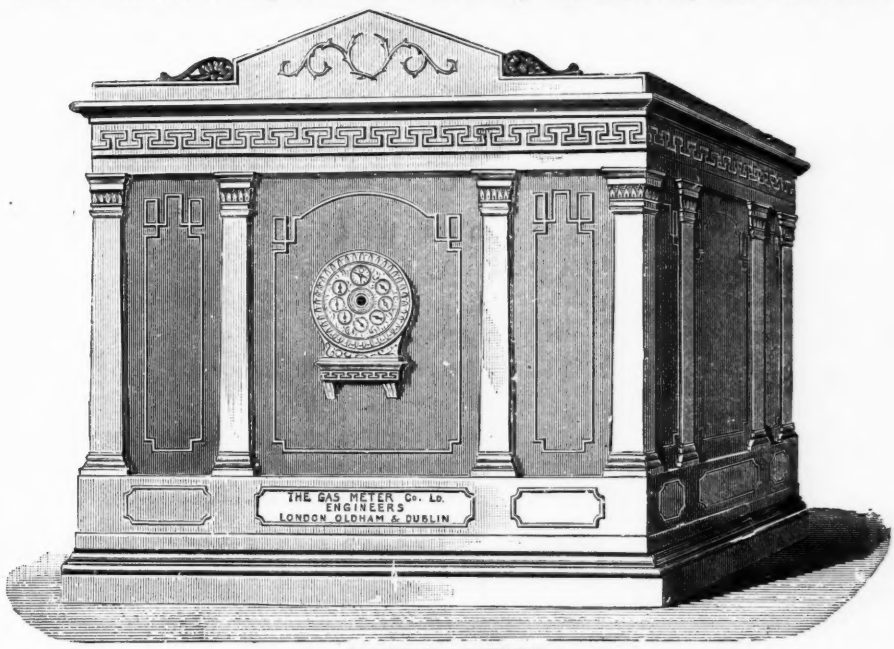
Sole Makers of the celebrated "ACME" GAS COOKERS used by H.R.H. the Duke of York, CARVING-TABLES, HOT CLOSETS, and JAPANNING OVENS, &c.

THE GAS-METER COMPANY, LIMITED

MANUFACTURERS OF

WET AND DRY GAS-METERS, STATION METERS, GOVERNORS, GAS APPARATUS, ETC.

SQUARE STATION METERS WITH PLANED JOINTS.



STATION METERS IN CYLINDRICAL CASES.

DESIGN No. 2 PATTERN.

STATION METERS MADE AT THE COMPANY'S WORKS, OLDHAM, LATE WEST & GREGSON. Established 1830.

For Prices and ***Particulars apply to***

R. L. ANDREWS, General Manager.

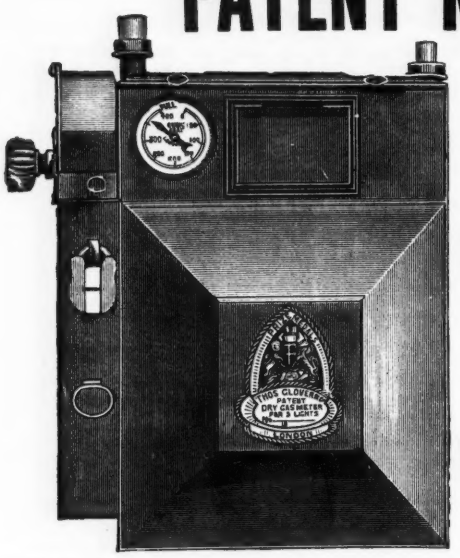
Works: 238, KINGSLAND ROAD, LONDON; UNION STREET, OLDHAM; HANOVER STREET, DUBLIN.

Telegraphic Address: "METER."

[See Advertisement on back of Wrapper.

THOMAS GLOVER & CO.'S

PATENT NEW IMPROVED PREPAYMENT METER



For Pennies, Shillings, or any Coin.

Simple in Mechanism.
Positive in Results.
Price Changer *in Situ.*

GUARANTEED FOR FIVE YEARS.

Telegraphic Address: "GOTHIC LONDON." Telephone No. 6725.

THOMAS GLOVER & CO., LTD.,

DRY GAS-METER MANUFACTURERS,

214 to 222, ST. JOHN ST., CLERKENWELL GREEN, LONDON, E.C.

BRISTOL: 62, VICTORIA STREET. *Telegraphic Address: "GOTHIC."*

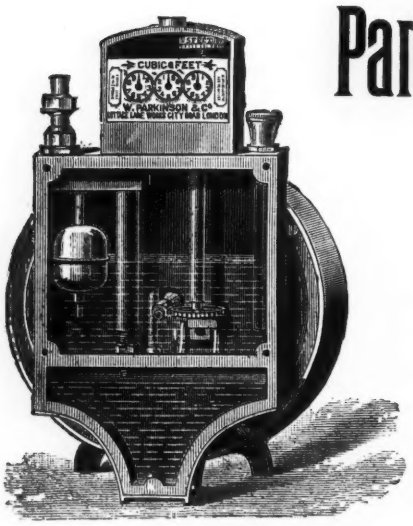
BIRMINGHAM: 1, OOZELLS STREET. *Telegraphic Address: "GOTHIC."*

MANCHESTER: 37, BLACKFRIARS STREET. *Telegraphic Address: "GOTHIC."*

W. PARKINSON & CO.

MANUFACTURERS OF WET & DRY METERS.

OLDEST ESTABLISHED FIRM IN THE TRADE.



Parkinson's Cast-Iron Case Meter.

Works with very little friction.

Will stand very high pressures.

Cannot possibly be shut off by sudden increase of pressure; the float being affected by outlet gas only.

Allows for loss of water by evaporation without materially affecting the registration or shutting off the gas.

Unexcelled for Simplicity of Construction, Excellence of Workmanship, and Accuracy of Registration.

COMPENSATING METERS,

In Tinned or Cast-Iron Cases.

COTTAGE LANE WORKS, CITY ROAD,
LONDON.
Telegraphic Address: "INDEX LONDON."

BELL BARN ROAD WORKS,
BIRMINGHAM.
Telegraphic Address: "GAS-METERS, BIRMINGHAM."

[See also Advt. p. 324.

CONTENTS.

EDITORIAL NOTES:—
GAS, LIGHTING, &c.— PAGE
The Chartered Meeting 281
The Report and Accounts of the South Metropolitan Gas Company 282
Fires Due to Oil and Gas Lighting 282
Why Coal-Tar Products are "Made in Germany" 283
WATER AND SANITARY AFFAIRS—
The Metropolitan Water Question—The London County Council and the Outside Authorities 283
ESSAYS, COMMENTARIES, AND REVIEWS:—
Gas and Water Companies in the Stock Market 284
Electric Lighting Memoranda 284
Obituary—Mr. Charles Clement Walker 285
"Gassing": Its Prevention and Cure 286
The London Water Bills of the Present Session 287
COMMUNICATED ARTICLE:—
Sulphate of Ammonia. By H. H. Cousins, M.A., Principal of the South-Eastern Agricultural College, Wye (Concluding Article) . 288
TECHNICAL RECORD:—
The Incorporated Institution of Gas Engineers 289
Society of Engineers 289
The Composition and Toxic Effects of Certain Gases 290
REGISTER OF PATENTS:—
Connecting Coin-Freed Apparatus to Gas-Meters—Hollanders, E., Leather, C. J., and Taylor T. 290
Coin-Freed Mechanism for Gas-Meters—Whitbread, S. J., and Griffiths, J. R. 290
Street Gas-Lamps—Bellamy, C. R. 291
Street Lamp Fittings—Bellamy, C. R. 291
Generating Acetylene Gas—Luis, C. G. 291
Incandescent Gas Burners—Lea, J. W., and Ferrins, J. H. . . . 291
Manufacture of Acetylene Gas—Pym, E. B., and Gore, J. . . . 291
Burning Rich Hydrocarbon Gases—Wigham, J. R. 292
Recovering Cyanides from the Waste Products of Gas-Works—Lewis, G. P., and Cripps, F. S. 292
Treating Coke for the Formation of Block Fuel—MacKinnon, A. F. 292
Gas Stoves or Heaters—Boult, A. J. (Wunderlich, A.) 292
Gas Motor Tramcars—Holt, H. P. 293
Burners for Incandescent Gas Lighting—Bartlett, F. G. . . . 293
Air-Gas Apparatus—Vriesland, A. I. van 293
Patent Notices 293
CORRESPONDENCE:—
Carburetted Water Gas and Carbon Monoxide 294
Choked Ascension-Pipes 294
The Berlin Tests of "Holophane" and "Frédureau" Diffusing Globes 294
Standard Meter Unions 294
PARLIAMENTARY INTELLIGENCE:—
The Allocation of Private Bills; Progress of Bills; Rural District Councils and Water Supply 294
LEGAL INTELLIGENCE:—
Supreme Court of Judicature—Court of Appeal—Andrews *v.* The Gas-Meter Company, Limited; The Rights of Preference Shareholders 295
High Court of Justice—Chancery Division—The Incandescent Gas-Light Company, Limited, *v.* The New Incandescent (Sunlight Patent) Gas Lighting Company, Limited; Same *v.* Dolski and Dunn 295
County of London Assessment Sessions—The Assessment of the South Metropolitan Gas-Works 296
MISCELLANEOUS:—
Meeting of The Gaslight and Coke Company 298
South Metropolitan Gas Company—The Report and Accounts . 301
Brentford Gas Company—The Half-Yearly Report and Accounts. 303
Provincial Gas and Water Companies 303
The Water Gas Agitation at Liverpool and Birkenhead—The Liverpool Gas Company's Defence; Garston still Unsatisfied; The Question Discussed by the Birkenhead Town Council . . 304
The Gas Question at Southport and Birkdale 305
The Duplication of the Water-Gas Plant at Birmingham . . . 305
Carburetted Water Gas at New Swindon 306
The Matlock Bath District Council and their Gas Undertaking—The "Assets" Difficulty; The First Month's Working . . . 306
Electric Lighting Notes 307
The London County Council and the Water Question—The Council and the Outside Authorities 307
Notes from Scotland 308
Current Sales of Gas Products 308
Coal Trade Reports 309
Gas and Water Companies' Stock and Share List 310
PARAGRAPHS:—
PERSONAL: Mr. John Aird, M.P.; Mr. Henry C. Burdett; Mr. Ambrose Cross; Mr. J. T. Jolliffe; Mr. W. Fairweather; Mr. J. Cartwright; Mr. William Watts; Mr. Thomas Hudson . . 286
The South Metropolitan Gas Consumers and the Company's Stock—Messrs. S. Cutler and Sons' Carburetted Water-Gas Plant—Electric Lighting by Gas-Engines—The Gas Question in Vienna 284
Southern District Association of Gas Engineers and Managers—Federated Institution of Mining Engineers 286
The Society of Gas Lighting and the Late Mr. Thomas—The London Chamber of Commerce and the Secret Commission System 288
Petroleum in Newfoundland—The Derivation of the Word "Gas" 289
The Water Supply of Bewdley 298
The Gas Question at Malvern Link 303
The Pay of Gas and Water Labourers at Oldham—Incandescent Gas Lighting at Belfast 305
Increase in the Price of Gas at Ellesmere—Sales of Shares . . 307
Reductions in Price—The Management of the Nelson Corporation Gas Undertaking—Birmingham Corporation Gas-Fitters' Benevolent Fund—Increased Gas Consumption at West Bromwich—New Water-Works at Cranbrook—The Assessment of the Lancaster Gas-Works and Mains—Shocking Gas Suffocation Accident at Drogheda—Dinner of Gas Workers at Doncaster—The Leeds Gas Workers' Dispute to be Submitted to Arbitration—Distressing Gas Explosion at Norwich 309
Explosions in Electric Light Culverts in Brussels—The Water Supply of Northam and Appledore—The Hertfordshire County Council and the London Water Bills—Gas and Electric Lighting in Georgetown—The Lead-Poisoning Epidemic in Derbyshire. 310
The Recent Conviction of the Crystal Palace District Gas Company—The Position of the Teignmouth Gas Undertaking—The Cost of Haulage at the Coventry Gas-Works—The Public Lighting of Canterbury—Abolition of Meter-Rents at Malmesbury—The New Gas-Works at Southborough 311

EDITORIAL NOTES.

The Chartered Meeting.

THE meeting of The Gaslight and Coke Company last Friday was well attended, and the proceedings were interesting, albeit the assembled proprietors were not more curious than usual as to the actual position and prospects of the vast undertaking which provides such handsome dividends. The central feature of the situation is the very large increase of the gas consumption in the Company's district; and this most valuable proof of the soundness and the improving character of the undertaking was naturally made much of in the Governor's address. Those who make it their business to attend these meetings have never been kept short of statistics. Figures big and small, ratios, percentages, vulgar and decimal fractions, pour out of the Horseferry Road *bureau* in any quantity, on the slightest provocation. There is an unlimited supply of calculated results "on tap," so to speak, at this establishment; and nobody is sent empty away from the overflowing fountain. The Governor, it is true, is not particularly happy in a torrent of figures; usually giving his audience the impression that while he "lisps in "numbers, and the numbers come," he does not always preserve a lively consciousness of their significance. He struggles through with them bravely, however, and has his reward in the hypnotized condition of the majority of his hearers. So it was on Friday. The meeting stolidly sat and gazed at the serried ranks on the platform—some of the good gentlemen, it must be confessed, looking more than slightly bored—while the Governor explained what the increased business gathered in by the Company meant in every branch of consumption. Who can entertain suspicion of the administrative ability of an executive so rich in statistics, and so liberal with them?

After this arithmetical display, it was easy to glide over the residuals question without mentioning the sore subject of "cornering" operations once gloried in, but now discreetly ignored. Colonel Makins dropped the quiet tear of sympathy over the coke and sulphate of ammonia markets, and only hinted at the consolation experienced by the Chartered Board from the fact of their poor trade in residuals being shared by other Gas Companies. It was not to be expected that he would admit the error of the tactics that have piled up the coke and sulphate in the stores. He and Mr. George Livesey disputed, as usual, over the quality of the Company's management of the residuals business; but, curiously enough, even Mr. Livesey did not brush aside the minor question of whether it is better to sell coke by agreement or by tender, in order to make it clear that the main point is to get residuals sold off as quickly as made. The Governor declared that every ton of the huge stock of coke that figures in the Company's accounts is sold. Mr. Livesey rejoined that the circumstance of its being where it is is the prime factor in the actual coke problem. Manifestly, all this coke will have to go between now and the next meeting of the Company, or the proprietors will feel that someone has not kept faith with them in this respect. Let the coke disappear, and nobody will care under what arrangements it has been disposed of. The assurance from the Chair that it has been sold, cut the ground completely from under the condemnation that would otherwise have been passed upon the "cornering" scheme that was so light-heartedly entered upon by the Governor, and has resulted so disastrously for the Company.

Very little was said at the meeting about the way in which the dividend is to be earned in the future. It was understood that this is to be managed somehow; and not a word was heard of increasing the price of gas, which would be a disastrous step for the Company to take in their present circumstances. If the Administration can only turn their accumulations of residuals into money, so as to bring the proceeds into the next account, the difficulty will disappear. With the disposal of the Beckton incubus, the markets will certainly rise. No more cornering will be attempted, so that every product of the works will be converted into cash as quickly as the gas itself; and the splendid increase of gas consumption will do the rest. The magnificent reserve of strength in this great undertaking was rightly recognized in the Governor's address. It is this, of course, that screens administrative mistakes, up to a point. He may rest assured that nobody who is at all cognizant of the facts will ever think lightly of the

Chartered undertaking. But unless the public are to hold more lightly than ever the reputations of the men who happen to be for the time being at the head of it, the Administration must turn over a new leaf. They can do it, when compelled by sufficient pressure; and they will have to do it now.

For the Company are going to Parliament next session, and their treatment there will be influenced very largely by the conduct of the Administration during the ensuing year. The Directors have given instructions for a Bill to be prepared to authorize the consolidation and simplification of the capital; and it is greatly to be hoped that all classes of the proprietary will unite to sink their financial differences for the common good. A year has already been lost through the difficulties raised by the holders of various preferential stocks; and though the delay will give the Management time to pull itself together, and show that the consumers are not to be made to pay for blundering at head-quarters, yet the opponents of the Company will also have this additional time for looking about them and appraising the benefits realized by those Gas Companies who have already consolidated their stocks. Besides, the Company will probably ask for some additional capital powers while they are about it; and these will not be obtained without a struggle. In this emergency, all the strength of the Metropolitan Gas Industry will be disposed to rally to the support of the "old Chartered," as Mr. Livesey called the Company last Friday; and if the present heads of the undertaking, by want of tact or good feeling, alienate those who would befriend the Company in the hour of trial, their perversity will be unpardonable.

The Report and Accounts of the South Metropolitan Company.

THE Directors' report and statement of accounts relating to the past half-year's working of the South Metropolitan Gas Company will be found in another part of the present issue of the "JOURNAL." The report states that the profit on the half-year's working is enough to pay the same dividend as before; this result being due to an increase of 10 per cent. in the Company's business, "coupled with "small savings on almost every item of expenditure" over which the Administration and the Company's servants have control. This large increase of gas consumption in the South Metropolitan district is a very remarkable and gratifying fact, look at it how we may. It means a valuable accession of strength to the undertaking; for though it is hardly necessary to point out that increased gas-rental is not all profit, all new business is at least twice as profitable as the bulk of that to which it is gathered. Not a word is said in the report on the subject of prepayment meters, which have now lost the charm of novelty. These South Metropolitan reports always disclose the subjects of consideration which are at the time uppermost in the Directors' minds; and it is clear that at the present juncture the low value of residuals and the question of rating occupy this position, to the exclusion of other topics. Let us hope that the products markets, having gone to pieces badly during the past year, may recover in the immediate future. There is no use in crying too long over spilt milk, though, despite the adage, a sharp outcry at the proper time may serve to prevent the recurrence of the accident. There is one gleam of comfort to be derived from such figures as the present report mentions so sorrowfully—there is not much fear of coal prices being unfairly raised against the Gas Companies; and this point is duly made.

The South Metropolitan rating appeals have been dragging their slow length through the Sessions Court, by stages; and this irritating experience has caused the Directors to break out into the complaint that fills the longest paragraph of their report. It is shown that nearly the whole of the charge for rates comes upon the consumers of gas, and not upon the shareholders of the Company. Some Boards would see in this circumstance a reason for bearing up cheerfully under whatever imposts of the kind the rating authorities chose to lay on the gas business; but this peculiarly-constituted Board see in it an additional vexation. The appeals being still pending, the Directors cannot express themselves fully as to the points of practice now at issue between the Company and the parishes; but the report hazards a fling at the illogicality which gives the "compound householder who is "rated at £10 a year," paid in the first place by his landlord, a vote and voice in the spending of rates paid by the great trading and transit corporations. This is truly enough characterized as "taxation without representation." It is equally correct to say that "if some plan of direct "rating could be adopted, to make the compound house-"holders feel the burden of the rates they now pay "indirectly, they would have an interest in economical "administration which is at present lacking." The trouble is an old one, of course; and, be it said with all respect, the reflections of the Directors upon the difference between the Public and Property are of academical interest only. The day of property qualification for the franchise has long past; and though the new fashion has its illogicalities and its imperfections, it will have to make a big record of injustice and inefficiency if it is to beat the old in these respects. There is more actuality in the plea that "the "system of rating public companies is very uncertain, "and opens the door to endless disputes, which involve "heavy expenses." It would be far more sensible if the companies and the rating authorities could agree upon some simple proportion of rates to receipts, which would not only disestablish the ravaging army of rating "experts," but would also remove the risk of injustice being done at any re-valuation, by reason of the fortuitous circumstance of one side being more ably championed than the other.

The accounts do not call for much detailed comment. The capital account shows for the first time the effect of the conversion scheme; the total sum now standing to the credit of the account being £6,596,629. Gas returned £473,490, as compared with £429,822 for the corresponding period of 1895. The number of prepayment meters in use has further risen to 56,902; the ordinary meters having also increased considerably. Residuals returned £145,352, as compared with £150,541. The coals cost £231,714, against £207,861. Carbonizing wages rose from £48,846 to £52,694. Repairs and maintenance are less. Distribution is a little more. Rates and taxes, as the report complains so bitterly, have risen from £20,815 to £29,480. The balance to be carried to the net revenue account is increased from £153,830 to £164,786. An exceptional charge of £10,975 appears to the debit of the net revenue account; being the value of stock cancelled in accordance with the Act of 1896. The statement of coals shows that the Company have not returned to the use of cannel. The stock of coke has decreased one-fifth; but that of tar has been allowed to grow much heavier.

Fires Due to Oil and Gas Lighting.

ACCORDING to the report of the Chief Officer of the London Fire Brigade, as briefly summarized in the last issue of the "JOURNAL," the casualties and catastrophes due to the imperfections of the common petroleum oil-lamp do not tend to become fewer or less painful as time goes on. Notwithstanding all that has been said on the subject, it comes with rather a shock when the curt statistics tell us that, of the total number of last year's fires in the London district which can be accounted for, no fewer than 512, or 14 per cent., were traceable to the use of oil-lamps. It is not to be overlooked that 345 fires were ascribed to the use of gas for various purposes; but the character of the oil accidents differed widely from those in which gas was implicated. The most unsatisfactory feature of these fire statistics, however, has been noticed by the Chief Officer himself—there is no graduating of the fires in the order of their importance. Everything is a "fire" which is so reported to the Brigade; and rightly so, from their standpoint, because it is not feasible to discriminate between the calls for the Brigade's services. All must be counted and tabulated. At the same time, it is impossible to shut one's eyes to the fact that "there are degrees" in fire damage as in other matters. A big timber fire may bulk largely in the technical records of the Brigade, yet possess much less public interest and importance than a sudden flare-up in a back parlour, of which the Brigade may never hear until it is all over. The Chief Officer admits that hitherto there has been no satisfactory definition of a serious fire. But it is greatly to be desired that something of the kind were attempted by those who have the compiling of fire statistics. It must be generally conceded, for instance, that loss of life makes a fire serious; and a correspondent of "London" has accordingly recast last year's fire statistics with special reference to this consideration. The result is to place the use of mineral-oil lamps and stoves in a much more unfavourable position than they occupy in the official statistics. There were 106 lives lost in London last year, in connection with 77 fires.

Of these, 38 lives and 15 fires are classed as "unknown" in respect of cause or origin. Then there were 36 deaths, at 32 fires, ascribed to "mineral-oil lamps and stoves and "mineral oil." Next—a long way after—come 12 deaths and 12 fires due to children playing with fire; eight deaths and as many fires were caused by clothes igniting at, or persons falling upon fire. Candles caused two deaths and two fires. Only one death, at one fire, is traced to "seeking "for an escape of gas with light." This way of sorting the facts puts a very different face upon the subject, and exhibits the most popular means of artificial lighting in something like their true colours. Gas improperly treated is, of course, capable of doing a great deal of mischief in a house. But the great difference between fires due to gas and those caused by mineral-oil lamps consists in the fact that, whereas the former are, as a rule, damaging to furniture and property, the latter are more dangerous to the person. This is obviously due to the circumstance of the gas-light being usually a fixed point, out of people's way; while the oil-lamp is literally always at one's elbow.

Why Coal-Tar Products are "Made in Germany."

In the current discussions respecting the competition of Germany and other countries with British trade, it is inevitable that the example of the coal-tar products industry should be continually cited. Certain members of the Royal Commission on Technical Education, who some fourteen years ago inquired into the condition of arts and industries in Germany, have recently made a supplementary investigation, in order to note the changes that have occurred during recent years. The result of this second inquiry has been embodied in a letter to the Duke of Devonshire, published as a parliamentary paper. One of the typical manufacturing undertakings taken note of by the inquirers is the Badische Anilin und Sodafabrik, which in 1888 employed less than 2400 hands. It now finds work for 4800; and the factory covers a site of 210 acres, out of which 60 acres are actually built over. One hundred skilled chemists and thirty engineers constitute the technical staff, to which no parallel exists in this country. Upon this "The Times" remarks in a leader that "the "production of coal-tar colours is a very special branch of "industry depending perhaps more than any other that "can be named upon chemical skill and knowledge. The "fact, however, remains that the industry was originally "in English hands, and might have remained there had "English manufacturers known how to appreciate and "utilize the fundamental discoveries of their country-"men." The question has often been asked why the coal-tar colour and drug industry should have flourished so well in Germany, as compared with its condition in the country of its birth. Sir B. Samuelson has lately essayed to supply some definite information upon this point in a letter to "The Times" upon the leader just mentioned. His statement is that we lost this manufacture because the trade in England was shut up for fourteen years by a "master patent," while no controlling patent had been sanctioned in Germany, so that anyone could take up the manufacture there; the result being, of course, development abroad and stagnation at home. He says: "At the present time, we, in this country, are handicapped "as much as before, but from an opposition of things. "The Germans having taken the lead, with their acquired "experience and large capital, keep it by patenting their "new processes in this country, but carry out their manu-"facture abroad. So long as they keep our market sup-"plied, which they take care to do, nobody is at liberty "to make the patented articles here. . . . Ours is the "only country in which it is not a condition of every "patent that the invention shall be exercised within the "realm. Surely it is 'free trade run mad' to allow the "foreigner to prevent a process from being carried out "in this country by our people if he does not choose to "come and do so himself." Thus Sir B. Samuelson; and it will be conceded that the picture he draws demands the particular attention of the Board of Trade and of everybody who is interested in the industrial fortunes of the country. It is no reproach to any arrangement of the laws of patent right, or of any other matter, to say that ours is the only country in which it operates. We are so used to being different from all other nations in every way, that uniformity of patent law requirements would be much more noticeable than difference. It does look, on the face of it, however, as though Free Trade and Patent Right do not go well together. All British inventors know to their cost how difficult it is to get anything like a "master patent" for Germany; and if Sir B. Samuelson's statement is correct, it indicates, apart from the particular case of the coal-tar products industry, that there is a method in this organized obstruction. Germany discourages patenting comprehensive inventions such as might be expected, if of any good at all, to form the bases of new industries. Then, when the industries are started in the country, those little improvements and advances which are so serviceable in protecting their commercial future can be patented easily enough. There is room for a thoughtful paper on national and international patent laws, taken in relation to Free Trade and Protection.

WATER AND SANITARY AFFAIRS.

That the Surrey authorities are quite capable of taking care of themselves, as asserted by the Chairman of their County Council, seems a little doubtful, if we are to rely on the statement made at Spring Gardens last Tuesday by Mr. Dickinson, the Chairman of the Water Committee of the London County Council. According to this gentleman, who ought to know, the supply of water outside the Metropolitan area is being carried on by the Companies at a loss, and is no part of London's "heritage." On this outer area, Mr. Dickinson observed, the Water Companies spent five shillings and received four. Surrey participates in this advantage, actually receiving its supply at less than cost price. What more can Surrey want? It is not likely to gain much at the hands of the London County Council. Mr. Dickinson's remarks as to securing "a profit "on their expenditure" in the separation of the Surrey territory may apply either to Surrey or to London; but with regard to one part of the bargain there is no doubt. The London authority has agreed to sell the local water area to Surrey on the basis of population, because this was the most favourable basis for London. Therefore, we presume, the basis was not the most favourable for Surrey. Rateable value might have been taken as the basis of the selling price; but in that case the result would have been very different. In other words, rateable value as the basis would have been favourable to Surrey; but the London County Council managed to substitute population. We hear much about the rapacity of the Water Companies. Yet in this instance the London County Council itself declares that the Water Companies are carrying on the supply to the outer area at a loss—a noble example which the Council apparently refuses to emulate. This is very shrewd on the part of the Council. That body is seeking to get possession of the entire undertakings of the Metropolitan Water Companies for less than their value. If this can be accomplished, the Council will then turn round on the authorities of the outer areas, and sell to them the possession of the outer supply on terms profitable to London. We congratulate Surrey and Croydon on the prospect.

If Surrey cannot be congratulated on the agreement which it has consented to enter into on the subject of the water supply, it may at least be congratulated on the self-abnegation of the London County Council in refusing to ratify the agreement until the terms and surroundings are more fully explained. The agreements are referred back for further information, more especially with regard to the negotiations with the other County Councils and boroughs concerned. Obviously, to strike off Surrey and Croydon is but a small part of a great question. The form in which the business was brought forward last Tuesday fully justified the remark made by the Earl of Onslow, that the Council was called upon to take a leap in the dark, of a very perilous character. The Earl being a member of the Surrey County Council gives the greater force to his protest. The amendment, which sent the report back to the Committee, was carried only by a majority of two. But the decision was fortunate, though it may be said that whether the decision was one way or the other mattered little, seeing that the resolutions of the Council can have very slight effect on the action of Parliament. There is, indeed, an idea on the Progressive side that the rejection of the agreements relative to the outer areas will be a serious check to the Purchase Bills. Possibly the agreements are designed as a check to the Bill which the Government has promised to introduce, and which is

likely to be in the form of a Water Board scheme, as on the previous occasion. Mr. Dickinson expressed the opinion that it would be a great assistance to the Moderates, in view of the conference between Mr. Chaplin and the Metropolitan members, if the Council could be induced in the meantime to pass a vote in opposition to the agreements. We apprehend that the question rests on a broader basis than this. It would be a more significant act if the county and borough authorities would wake up to a correct view of the situation, and themselves reject the agreements. The consumers in the outlying districts, comprehending a population of nearly a million and a quarter, are unquestionably being led into a trap, if they support the Purchase Bills of the County Council.

In the report of the Parliamentary Committee which will come before the Council to-day, great stress is laid on the importance of accepting the agreements which the Committee are making with the authorities of the outer areas. A long report gives an account of what is going on in this respect; and the Committee say that the rejection of the agreements would mean that the Council would be brought face to face with vigorous and united opposition from the whole of the Metropolitan counties and water area, as well as from the Water Companies. Should the Council simply defer its decision, the Committee argue that the Bills could only proceed to a second reading with all the disadvantages which would be due to the doubt and distrust which will have been created as to the ultimate policy of the Council. It does not appear to us that the agreements with the authorities of the outer areas are so complete as the report would indicate. Certainly the situation is not secure in regard to Middlesex, where a prospect of having to "pay through the nose" is distinctly apprehended and expressed.

The South Metropolitan Gas Consumers and the Company's Stock.—The high appreciation in which the stock of the South Metropolitan Gas Company is held by the consumers, has been further testified by the keen competition which took place for the last issue of £50,000 of stock. It was applied for three times over; and the result has been the addition to the register of about 1100 of the consumers as small shareholders.

Messrs. S. Cutler and Sons' Carburetted Water-Gas Plant.—We have received from Messrs. S. Cutler and Sons, of Millwall, a copy of their new descriptive circular illustrating the carburetted water-gas plants erected by them at Hornsey and Hastings. The plant comprises many special patented details, which provide for safety in working, ease of manipulation, and avoidance of undue wear and tear. The book, which is very well got up and neatly bound, has a frontispiece showing the general arrangement of the plant; and ground plans and photographs illustrate how it has been applied at the above-named places, where it is in continuous work, and is, we learn, giving every satisfaction.

Electric Lighting by Gas-Engines.—Messrs. J. L. Christy and S. A. Hasbrouck selected the subject of the determination of the cost of electric lighting by a gas-engine for their thesis at the Stevens Institute of Technology. They came to the conclusion, after an elaborate series of tests, that for private houses, summer hotels, and other isolated plants, a gas-engine is a very convenient and economical source of power for electric lighting. Taking the price of gas at $1·25 per 1000 cubic feet, a 16-candle light would cost 0·625c. per hour. Under a very light load, the plant is more costly than by burning the gas directly; but as the load increases, the cost diminishes. It is therefore far cheaper to use the gas in an engine to generate the electric light than to burn the gas as an illuminating agent.

The Gas Question in Vienna.—The "Neue Freie Presse" has recently stated that the opening of streets for the laying of the new municipal gas-mains in Vienna would be commenced in March at the latest. The anti-Semitic town councillor Herr Eigner, in the last debate on the Budget, estimated that the upheaval of the streets could not be brought to a conclusion in less than six years from its commencement. The work is to be begun in District ("*Bezirk*") III.; and in June at the latest extended to District I., and by the end of the year to District II. and all the principal thoroughfares leading to the railway stations. The Municipality must, according to the contract, take over the existing lamp-posts from the Imperial Continental Gas Association. It would, however, be impossible to shift the connections from the old mains to the new ones without an interruption of the street lighting; and therefore the Municipality propose to discard the old lamp-posts, in the main streets at least, and erect new ones. To prevent interruption in the house supplies when the Municipality commence the supply of gas, the new mains will be directly connected to the outlet-pipes of the meters until the town meters can be fixed. The consumption during the interval will be reckoned on the basis of that of the preceding month.

ESSAYS, COMMENTARIES, AND REVIEWS.

GAS AND WATER COMPANIES IN THE STOCK MARKET.

(For Stock and Share List, see p. 310.)

THE Directors of the Bank of England have further reduced their minimum rate of discount from 3½ to 3 per cent. As the reduction was a foregone conclusion, and its effect having already been discounted on the Stock Exchange, prices became rather easier owing to realizations. Business continues on a very small scale, so far as speculative dealings are concerned. But the best class of investment stocks are still being bought; and numerous small bargains have been effected during the week. Consols are higher on balance, though under the best. But Colonial loans have moved up distinctly; and Corporation loans are again being forced up by the cheapness of money Home Railway stocks are all lower, with a few exceptions, on realizations. Gas stocks have been less active, though, on the whole, the market presents a firm tone. The feature has been the weakness of Gaslight "A," which at one time marked a fall of 5 per cent., having been quoted as low as 313·18. Numerous transactions were recorded between 321½ and 314. A rally of 1 per cent. subsequently took place; and the stock was purchased on Saturday at 318. The stocks of the other Metropolitan Companies are all steady. With regard to the Suburban and Provincial Companies, Brentford new has risen 2 to 227·32 on the announcement of a dividend of 9 and 12 per cent. on the consolidated stock. In the Continental and Foreign division, Imperial Continental debentures are down 1 to 99·102; while Bombay issues have recovered ½, and San Paulo shows a similar improvement. Water stocks have been in request, particularly Kent and Lambeth.

The daily operations were: Monday opened very quietly; the only change being a rise of 2 in Brentford new, and a similar movement in Gaslight "H." Business was done in Gaslight "A" up to 321½; South Metropolitan, 148½; British, 56½; Cape Town, 15⅞; European, 25⅜; and Belgrano debentures, 107. Water stocks were extremely quiet and unaltered; but dealings were recorded in Kent 7 per cent. maximum at 219, and East London 3 per cent. debentures at 107. Tuesday was also a quiet day in Gas stocks—the most business being in Gaslight "A," which fell 2 per cent.. But the "H" stock rose 2; dealings being recorded at 185. Imperial Continental changed hands at 224; Buenos Ayres (new) at 10½; Bombay, 7; and San Paulo, 13⅜; while South Metropolitan marked 150. Water stocks were again steady. On Wednesday, Gaslight "A" was active; but business was recorded as low as 316, while the 6 per cent. debentures marked 210. Transactions were noted in Brentford (new) at 230; in Imperial Continental, at 224½; and in South Metropolitan, at 149½. Water stocks were more active—business being done in Chelsea at 336; East London, at 252½; Grand Junction "B," at 118½; Kent new, at 219; Lambeth maximum 10 per cent. (which rose 3), at 275½; and West Middlesex, at 312½. Thursday again saw a small business recorded. Gaslight "A" fell 2; business being done as low as 314. The "H" stock also marked 209½; Commercial new, 260; Imperial Continental, 224½; South Metropolitan, 148½; Buenos Ayres, 10½; and Monte Video, 16½. In Water stocks, there was no change; but business was recorded in Southwark and Vauxhall at 157½, and special dealings in Chelsea at 334. On Friday, Gas shares were moderately active. Gaslight "A" recovered 1, to 314·19, business being done at the latter figure; while the "J" stock marked 312½, "K" 185, and the 6 per cent. debentures, 208½. Business in Imperial Continental was done at 223½ and 225; in South Metropolitan, at 150; British, at 56¾; and Cape Town, at 11½. Water stocks were quiet. Kent rose 1 to 345·350; New River new, 1; West Middlesex, 2, to 312·17; and Southwark and Vauxhall, 1, to 155·60. Saturday was very quiet; and values remained unaltered. The most dealings were again in Gaslight "A," between 316 and 318; South Metropolitan, 150; and Imperial Continental, 225.

ELECTRIC LIGHTING MEMORANDA.

The General Meeting of the St. James's and Pall Mall Electric Light Company—The Products of the Electric Furnace—Fun on the Motor Car.

THE ordinary general meeting of the shareholders of the St. James's and Pall Mall Electric Light Company was held on Tuesday last, when the Chairman, Mr. Eustace J. A. Balfour, stated that the net earnings of the undertaking for the past year amounted to £21,369, out of which the Directors proposed to pay a dividend on the ordinary shares of 10½ per cent., as against 7½ per cent. last year and 6½ per cent. the year before. The preference shares, of course, carried their full 7 per cent. dividend; and the founders' shares would take £36 17s. 6d. each, which was after the rate of something like 3600 per cent. This is a picturesque figure which is worth remembering, though it is scarcely to be expected that the most reckless of touting electricians will go about the country telling people that dividends at this rate are a normal feature of the electric lighting industry. During the year, there was an increase of 17,017 in the number of lamps connected with the Company's mains, as compared with an increase of 16,569 in 1895; the total number being

now 108,803. The output of the stations had increased by about 500,000 units, while the total cost of producing the unit, leaving out depreciation, had again been reduced by 15 per cent. All this tells a tale of steady progress; and the Chairman was justified in expressing the opinion that the Company have a fairly smooth career before them, with the prospect of earning reasonable annual profits. The capital account is closing up; and the annual lamp increases show a "decremental rate" of growth, which testifies to the approach of the point of saturation for the Company's wonderful district. It is worthy of note that up to the present time the Company have only had to supply a dozen public street-lamps. Waterloo Place and Regent Street are, however, being equipped with electric lamps; so that the Company will soon be able to boast an extended experience in this line of business, which will be more interesting than profitable.

It may be noted that the present list prices of the Acetylene Illuminating Company for calcium carbide manufactured at the Falls of Foyers works are: £28 per ton for quantities of not less than 1 ton; £30 per ton for quantities of from 5 cwt. to 1 ton; and 5d. per lb. in sample drums. One is rather at a loss to know whether to discuss this manufacture under the heading of gas or electricity. At all events, the coal-gas industry has nothing to do with calcium carbide or acetylene; but electrical engineering possesses the monopoly of the preparation of this singular product. From time to time one hears rumours of some chemical process for the manufacture of calcium carbide; but these suggestions come to nothing. It may be reasonably expected that the able technicians who are quietly engaged in the manipulation of the remarkable manufacturing plant at the Falls of Foyers are gradually getting to know all there is to be known concerning the capabilities and limitations of the electrical furnace. Carbide of calcium at £28 per ton and pure aluminium at £155 per ton may for the time being represent the latest conquests in this particular branch of pyrology; but this in only the beginning of one of the most fascinating of modern industrial developments. The marvel is that so few products issue from the electric furnace. Surely, it may be thought, many things are possible to an industrial process under which iron volatilizes and lime runs like syrup. No poet or romancer ever imagined more potent means for unlocking the secrets of matter and causing it to enter into new combinations; yet the range of the utility of the electric furnace, even under experimental conditions, is singularly restricted.

Those who wish to know all there is to be known at present concerning the performances of motor cars should read a letter signed "An Outsider," which appeared in the "Engineer" for the 22nd ult. It will be no light task to undertake, inasmuch as the effusion in question runs to four-and-a-half columns of our contemporary's ample space; but the study is made as easy as possible by a plentiful sprinkling of mordant humour, which serves to make the writer's facts less indigestible than they would otherwise appear. A good example of the writer's style occurs in his description of the doings of the Bersey electrical carriage. He says he saw one of these vehicles start for Brighton on Nov. 14, which is an interesting piece of information, as we were under the impression that electric motor cars were not in evidence on this historic occasion. This particular carriage was an open landau; and "as to the maximum distance it can travel, Mr. Bersey appeared to be satisfied with crossing Westminster Bridge—on the Brighton road—after accomplishing which, the carriage was steered for Victoria Station, *and I met it coming down the Station Hill at Brighton in fine style at five the same evening.*" The italics are ours. There is no positive information as to what had taken place in the interval. It transpires from the observations of this lively writer that the most prominent characteristic of the motor car is its disinclination to "mote." That is to say, they show best when in a state of absolute quiescence, as on a stand in an exhibition. We must confess that a similar feeling has come over us on occasions when machines of this description have been "on view." They have looked so elaborate of construction, and withal so disjointed, that one has felt quite glad to know there was no intention of putting them to work. The "Engineer" correspondent is very great on the electric carriage of the Britannia Motor Company. "This Company, too, only exhibited in motion upon one occasion, and that was when they gave a dinner—all those matters seemed to be managed by dinners—to the Press and several favoured individuals of the public, for the introductory purpose of demonstrating the qualities of their creation. They had two machines on the track. One was an ordinary Bath-chair, with the motor attached to the axle; and the other a kind of double perambulator on a large scale, with an appetizing picnic basket perched up in front on a level with the passengers' knees. This, however, contained accumulators. The Bath-chair was being charged from terminals on the track for two or three hours before the gentlemen at dinner had been given permission to smoke; and yet, I presume, after the most careful preparation for the occasion, when they came trooping on to the track it refused to proceed, and was discreetly taken away *hors de combat.*" The other similar car did give its owners a run for their money; but the makers had forgotten to provide it with a brake, and consequently it ran into another car, and so met its fate. The writer declares he has since seen the Bath-chair on two occasions. Once was when it was exhibited at the Stanley Show, where, with axles suspended, it was obligingly revolving its wheels before an admiring crowd. Again, on Nov. 14, it was apparently started with the rest of the auto-cars on the fifty-mile journey through the mud; but it is more than hinted that in this case also the easiest way to Brighton was found to be *viâ* Victoria. It is, of course, easy to make fun of the figure cut by the motor car up to the present time; and the humorous is perhaps the best way in which to look at the whole thing—especially if one has not put any money into it. The motor car, electric or otherwise, may come in time; but it has certainly not come yet in unquestionable shape.

OBITUARY.

Charles Clement Walker.

It is with deep regret that we announce the death of Mr. Charles Clement Walker, the sole surviving partner in the firm of Messrs. C. and W. Walker, of Donnington, which sad event took place at his residence, Lilleshall Old Hall, on the 4th inst., in his 75th year.

In the death of Mr. Charles C. Walker, the head of the well-known firm of Messrs. C. and W. Walker, of the Midland Iron-Works, Donnington, near Newport, Shropshire, there has passed away one of the oldest members of the gas engineering profession. He was born in 1822, in Clerkenwell, and was educated in London. He served his apprenticeship at Messrs. Maudslay's, marine engineers, of Westminster Bridge Road, and was subsequently engaged at Messrs. Rennies', in the same business. To show the bent of his mind, it may be mentioned that he was one of the oldest readers at the British Museum; for at the age of eighteen he obtained a reading ticket, and scarcely ever missed an opportunity of visiting the institution whenever he came to town.

In the earlier days of his career, he was engaged with his brother, the late Mr. William Walker, in the construction of valves and the subsidiary machinery of gas-works, at a small establishment in Little Sutton Street, Clerkenwell; but about the year 1858 they removed to Donnington, and commenced there in very limited works, employing about a dozen hands, the construction of valves, purifiers, purifier-covers, small gas-holders, &c. To show the great strides the firm made from such small beginnings, the works now at Donnington cover some twenty acres, and find employment for 700 men. Under the guidance of Mr. C. C. Walker, the firm have carried out some of the largest structures for the purification and storage of gas in this country and abroad.

Personally, Mr. Walker was a man of indomitable will and perseverance. He was a Justice of the Peace for the counties of Shropshire and Stafford; and some years ago he contested Dover in the Liberal interest, but was not successful. He was a member of the Astronomical Society and of several other learned bodies. Astronomy was his favourite study; and he had in his own grounds at Lilleshall an excellent observatory, containing a very powerful telescope and all the essentials for adding to his knowledge of that science. Archæology was another subject in which he took great interest; and he contributed many papers to magazines on both these subjects, and indeed on many others. He carried out excavations in the grounds of Lilleshall Abbey, and ascertained the position of the original foundations of that ancient edifice; and he subsequently wrote and published an interesting book on the history of the Abbey.

About twelve or fourteen years ago, he, at his own expense, laid out Wilmington Square and Northampton Square, in Clerkenwell, under Lord Brabazon's Act, and fitted them with vases, fountains, and seats, and gave them free for the benefit of the people for ever. His contributions to charitable objects and institutions, both in his own district and beyond it, were very extensive. One of the greatest acts of his life was to devote a large sum of money to one of the great surgical colleges, to form a fund to provide a prize to be given once in every five years for the best paper on the cause and cure of cancer.

His most recent public act was to present to the City of London a noble monument to the memory of Heminge and Condell, friends and fellow-actors of Shakespeare. It is situated in the Churchyard of St. Mary the Virgin, in Aldermanbury; and it was unveiled on July 15, 1896, by the Lord Mayor of London, in the presence of Sir Henry Irving and others specially connected with the subject. He also wrote and published a most interesting book upon the lives of these two men, and their connection with Shakespeare.

Mr. Walker was an excellent master—stern, but just; and he was well liked by all his employees. His illness commenced last Christmas-day with a severe attack of influenza, which subsequently developed into pneumonia and prostration, from which he never rallied. His interment takes place to-day, in Lilleshall Churchyard.

In connection with the foregoing notice of the late Mr. Walker, we may state that the business at Donnington and in London will be continued as heretofore, under the guidance of the General Manager (Mr. Alfred Featherstone), who has been connected with the firm for about a quarter of a century.

PERSONAL.

Mr. JOHN AIRD, M.P., and Mr. HENRY C. BURDETT have been placed upon the Committee of the Prince of Wales's Hospital Fund for London, to commemorate the sixtieth anniversary of the Queen's reign.

Mr. AMBROSE CROSS, who has been Water Engineer to the Loughborough Corporation for the past twelve years, has resigned. The Water Committee have placed on record their appreciation of the valuable services he rendered to the town.

Last Tuesday afternoon, Mr. J. T. JOLLIFFE, the Secretary and Manager of the Ipswich Gas Company, met with an accident. While he was being driven to the gas-works, his trap was run into by a runaway horse and trap. Mr. Jolliffe and his groom were both thrown into the road, and much shaken and bruised; and Mr. Jolliffe, who was cut on the head, had to be conveyed home in a cab.

At their meeting on Wednesday last, the Town Council of Kilmarnock testified in a tangible way their appreciation of the additional services rendered by Mr. W. FAIRWEATHER in connection with the erection of their new gasholder by voting him an honorarium of £50, and making a permanent increase of a similar amount in his salary. The efficiency with which the works are managed has enabled the Directors (as recorded elsewhere) to announce a reduction in the price of gas.

Mr. J. CARTWRIGHT, the Borough Engineer of Bury, made application for the vacant position of Water Engineer to the Sheffield Corporation; but the Corporation of Bury are anxious to retain his services, and have offered him generous terms to remain with them. They propose that he shall be paid, in addition to his present salary of £600 per annum, the sum of £750 for services rendered in connection with the construction of the new water-works at Cloughbottom and the new sewage works; that he shall be at liberty to take a limited practice; that he shall continue to occupy his present position for a further two years, or until the completion of the sewage works; and that, at the end of this period, he shall be retained by the Corporation as Consulting Engineer, with a first claim on his services for all new works, for three years certain, at an annual salary of £250.

From 32 candidates, the Sheffield Corporation Water Committee have chosen Mr. WILLIAM WATTS, M.Inst.M.E., F.G.S., the Water Engineer to the Oldham Corporation, for recommendation to the Council for the post of Resident Engineer of the Little Don Valley Water-Works. One condition of the appointment is that Mr. Watts shall reside within two miles of the dam-head at Langsett; and he is to be prepared to enter upon his duties at as early a date as possible. The salary attached to the post is £1200 per annum. Mr. Watts has had a wide and varied experience in preparing schemes of reservoir construction, and in carrying out the practical work of undertakings of this character. It may be remembered that, at the last autumn meeting of the British Association of Water-Works Engineers, he read a paper on "Reservoir Embankments;" and he is down for a paper at the meeting of the Association next Saturday, on the subject of "Water Supply, Drainage Areas, and Compensation Water to Riparian Owners."

Reference is made in another part of the "JOURNAL" to the large increase in the gas consumption at West Bromwich in the nine months ending Dec. 31, 1896, as compared with the corresponding period of 1895; and the fact served to emphasize the remarks of the Mayor (Mr. C. Akrill), at the meeting of the Town Council last Wednesday, when moving the adoption of a recommendation of the General Purposes Committee, based upon suggestions emanating from the Gas and Finance Committees, that the salary of Mr. THOMAS HUDSON, the Borough Accountant, should be raised by £50 per annum as from the 1st ult., with a further increase of like amount as from the commencement of next year. Mr. Hudson discharges the duties of the two offices of Borough Accountant and Secretary of the Gas Department; and therefore his position is one of great responsibility. The stock on the books of the Corporation now stands at £431,200; and the Mayor bore testimony to the fact that in no case had there been a loss, but on the contrary a handsome profit upon it. The recommendation was unanimously adopted.

Southern District Association of Gas Engineers and Managers.—The annual meeting of the Association will be held on Thursday, at the Holborn Restaurant. The business, as usual on the occasion of the first assembly of members in the year, will consist only of the presentation of the report of the Committee and the delivery by the President (Mr. J. W. Helps, of Croydon) of his Inaugural Address. At the close of the business, the annual dinner will take place.

Federated Institution of Mining Engineers.—A general meeting of the Institution is to be held in Manchester on the 17th inst., under the presidency of Mr. Lindsay Wood. Among the papers to be submitted will be one on "The Detection and Estimation of Carbon Monoxide in Air by the Flame-Cap Test," by Professor Frank Clowes, of Nottingham; and papers read at previous meetings will be open for discussion. The members will dine together in the evening; and the two following days will be devoted to excursions.

"GASSING:" ITS PREVENTION AND CURE.

AT a recent meeting of the Liverpool Section of the Society of Chemical Industry, two papers bearing on gas poisoning were read and discussed together. Between them they appear to furnish all the reliable information at present available on this important subject, to which recent occurrences have lent fresh interest. The first paper was by Mr. Arthur Carey, and it dealt chiefly with chemical works "gassing," and the use of rescue appliances in noxious atmospheres. The second was by Mr. Douglas Herman; and it referred exclusively to poisoning by carbonic oxide. Both papers contain matter which does not directly concern gas engineers, and we therefore propose to give in a condensed form only so much of their contents as bears upon the illuminating gas industry. The full text of the papers appears in the "Journal" of the Society for Dec. 31.

Mr. Carey spoke of the results of some experiments with emergency respirators and apparatus, of the nature of those mentioned in a "Note" published in the "JOURNAL" for Nov. 10 last (p. 901). This investigation has been carried on for some two years at the works and under the auspices of the United Alkali Company; Mr. Towers, of Widnes, assisting in the later experiments. Sulphuretted hydrogen was the test gas, and was mixed with air in known proportions in a gasholder for the purposes of experiment. The gases as let out of the holder were tested by lead acetate paper, which was found to blacken in an atmosphere containing 0·01 per cent. of sulphuretted hydrogen by volume. It was further found that a mouse placed in an atmosphere containing 0·1 per cent. of this gas by volume became insensible in about six minutes, but recovered again in fresh air. In another experiment, a mouse placed in an atmosphere containing about 0·05 per cent. of the gas showed no signs of distress after thirty minutes. The important conclusion is therefore reached that "gas which will not blacken lead paper will not harm men."

The only absorbents found to be of any practical use were granulated soda-lime and charcoal saturated with caustic soda. The best results were obtained with Mr. Towerrs's mixture of very finely-divided charcoal and a high percentage of caustic soda. Mr. Carey speaks favourably of the apparatus designed by Mr. Towers for using this mixture in a respirator. Next comes the discussion of the class of rescue appliances which involve direct communication with the outer air by a pipe. Any apparatus of the kind requiring a pump to work it (like diving appliances) was ruled out, on the score of complication. It was also found that a man can, without much inconvenience, draw his breath through as long a pipe as he can drag after him. Two men are required to work an appliance of this description—one to rescue, and the other to look after the free end of the pipe. In spite of all its disadvantages, this "safety-pipe" kind of apparatus is indispensable when there is reason to suspect the absence of oxygen or the presence of some injurious gas which a respirator will not absorb. There yet remains a class of appliances which contain within themselves the oxygen necessary for respiration; but these are all rejected as valueless for emergency work, where the apparatus may be years without use. The final conclusion arrived at is that, where there is no occasion to suspect the absence of oxygen or the presence of gases not absorbed by caustic soda, a Towers respirator is the most serviceable rescue apparatus. Where, however, there is reason to suspect the absence of oxygen, or the presence of carbonic oxide or oxides of nitrogen, direct connection with the open air is essential; and the use of a "safety-pipe" is necessary. All rescue apparatus and the intended users should be paraded and inspected once a month.

Mr. Herman referred to the rapidly increasing industrial use of gases containing more or less of the highly poisonous carbonic oxide; and he gave tables of analyses of these gases, showing the proportions in which the carbonic oxide occurs.* He also drew attention to the increase of danger due to the working of gas-producers under pressure. The earlier producers were worked by natural draught, so that any leakage was that of air into the producer, where it burnt up a portion of the gas. The forcing of air through the fuel by pressure altered this state of things, leaks operating to let the producer gases out. Hence brickwork producers are apt to be unsafe. Mr. Herman has discovered for himself that mice are particularly sensitive to the toxic action of carbonic oxide, and strongly supports a recommendation of Dr. Haldane that they should be used to give early indication of the presence of this gas in the atmosphere.

Passing on to describe the effects of carbonic oxide on the human subject, Mr. Herman states that the first indication is a dizzy, drunken feeling, which very nearly resembles that of alcoholic intoxication. Another indication is the feeling of intense cold experienced by the patient in the extremities, and indeed the whole surface of the body. Unlike alcohol, carbonic oxide has no stimulating effect; and the absence of this makes it all the more necessary for the natural respiration to be supplemented. "When the dizzy, intoxicated feeling occurs, the man should be at once taken to the fresh air, for it is likely that worse may follow as soon as the remaining de-oxidized blood has had time to reach the nerve centres. Oxygen should be

* Some extracts from these tables will be found in our "Technical Record" to-day, p. 290.

administered with the least possible loss of time." If the man should really be intoxicated by alcohol, this line of treatment will still be good for him; so that it is best to treat all doubtful cases in the same way. Mr. Herman quotes Dr. Haldane's testimony that very little actual distress accompanies the action of carbonic oxide, especially when greatly diluted with air.

Lime burning is a source of carbonic oxide which when the kilns are buried in the ground, as is often the case, may travel through a porous soil to a considerable distance and, unsuspected, work fatal mischief. The proportion of carbonic oxide in lime-kiln gases is, however, only 1·5 per cent. as compared with 32 per cent. of carbonic acid.

The author referred to some communications he had had from Mr. James Stelfox with regard to the introduction of carburetted water gas for illuminating purposes, who also supplied analyses of that gas and of common coal gas. In Belfast, these two gases have been supplied in equal proportions. Mr. Herman mentioned the case of poisoning by gas in Bath last November; stating that, in the opinion of the medical attendant—Dr. Samuel Craddock—the victims in this case died from carbonic oxide poisoning, "as shown by the crimson hue in the face." Mr. Ellery, of Bath, and Mr. Stelfox were both cited as declaring that they do not consider there is any evidence to prove that carburetted water gas is more insidious or more deadly than ordinary coal gas. Mr. Herman, however, thinks that the toxic effect of illuminating gas is likely to be enhanced directly as the proportion of carbonic oxide in it is increased. Upon this point he observes: "Having regard to the manifest advantages, under certain conditions, of carburetted water gas, I should not be disposed to oppose its use under proper regulations; but I hope, before its use becomes general here, similar precautions will be taken as, according to Dr. Winter Blyth, are observed in America, to guard against the danger from escapes owing to the careless manner in which gas-fitters usually perform their work." In America, before the gas-fitter asks the company to make the connection with their main, he proves the pipes. All the outlets which have been left for brackets and pendants, &c., are, with one exception, stopped up with either plugs or screwed caps. A force-pump containing a few drops of sulphuric ether is then attached to the outlet which has been left, and the pump is set to work until a high pressure has been registered. A high pressure is necessary, for the iron pipes may have many latent weaknesses—pinholes filled with grease, seams just ready to burst, &c. These, when a high pressure is employed, at once become apparent." This is all very prudent, of course; but it is obvious that no care exercised over the gas connections can avail to prevent mishaps due to pulling down pendants too far, blowing out gas-lights, and so forth.

In the discussion upon the papers, Mr. Forbes Carpenter spoke to having had a conversation with Mr. Ellery at Bath the day before the two deaths already mentioned. Mr. George E. Davis, referring to the introduction of carburetted water gas, observed that "if gas-works, from motives of economy, persisted in distributing a very poisonous mixture, which certainly was not intended in any of the Acts of Parliament under which their works were established, they should do so under special rules and regulations." It is not often that one comes across so many different assumptions in so few words. Mr. T. A. Reid, speaking on the subject of apparatus for enabling men to work in noxious atmospheres, expressed an objection to anything which depends on the use of an absorbing medium in a respirator. His experience of such appliances is that they are very tiring to the lungs; and he prefers the air-pipe apparatus for all purposes of the kind. He considered the use of an oxygen bottle essential in the cure of gassing; no fatal case having occurred in his experience since the oxygen bottle had been in use. The Chairman of the meeting (Dr. C. A. Kohn), in summing up the discussion, made the important observation that he had had occasion recently to inquire into the extent to which carbon monoxide poisoning occurred in the United States; and he had been informed, on reliable authority, that the fatalities are not excessive. "In comparing the poisonous effects of carburetted water gas and ordinary coal gas, it was desirable to bear in mind that the latter also was a powerful poison, and that, in the case of an undetected escape, fatal results might follow from either.

Mr. Herman touched a critical point in this controversy when he "questioned whether the odour imparted to water gas would arouse a person from a sound sleep." He said it was "during sleep in a closed room that danger from an escape of carbonic oxide was most to be feared." This question of what is the degree or quality of noxiousness in the odour of illuminating gas that can be trusted to awaken a sound sleeper has never been properly decided. We may agree with most of the gas managers who have adopted auxiliary carburetted water-gas plant, that in the ordinary way its odour is distinctive enough to warn a person who is wide awake of the existence of a leak somewhere in his vicinity. Coal gas has never been accused of weakness in this regard; yet neither unburnt coal gas nor the more offensive gaseous mixture that results from the atmospheric burner of a gas-stove firing-back is sufficient to arouse a person from sleep. We venture to doubt whether anything that could be practically done to illuminating gas in the bulk could be relied upon to answer this purpose. The risk to the gas industry of the United Kingdom at the present juncture is that an illogical general inference may be drawn from some particular case of gas poisoning.

THE LONDON WATER BILLS OF THE PRESENT SESSION.

In the last three numbers of the "Journal," we have given an epitome of the general Water Bills which will come before Parliament in the present session. It only now remains to deal with the Bills relating to the water supply of London and the extra-Metropolitan districts.

The East London Water Bill is to authorize the East London Water-Works Company to issue £500,000 of debenture stock, redeemable at par after 25 years, bearing interest at such uniform rate as in the opinion of the Governor of the Bank of England shall be best calculated to secure the issue at par. After three years, a sinking fund is to be formed by setting aside the difference between the debenture interest, *plus* 1 per cent. for management, and the average percentage of dividend and interest paid for the year on the total capital of the Company, which is to be held and applied by the Chamberlain of the City of London, for the purpose of ultimately extinguishing such capital. Additional works are to be sanctioned, comprising two storage reservoirs in the parishes of Tottenham, Edmonton, and Walthamstow. The waters of the River Lea and other streams are to be taken. Nearly 100 acres of common or commonable lands are required for the works, which are to be completed within seven years. Power is sought for the making of agreements between the Company and other Metropolitan Water Companies for the use of pipes and the supply of water. The provisions of the Water-Works Clauses Act 1863 with respect to the supply of water to be furnished by the undertakers (except section 12), and with respect to the waste or misuse of water, are to be made applicable to the whole of the Company's undertaking.

The New River Company's Bill is to enable the Company to take advantage of the Staines Reservoirs, &c., Act of 1896. It is desired to issue £1,000,000 of debenture stock, "D," to rank next after the Company's debenture stock "C," created under the powers of the New River Act, 1896. The new issue is to be redeemable at par after 25 years, and is to bear such uniform rate of interest as shall secure its issue at par. New works are to be authorized, comprising connections with the works sanctioned by the Staines Reservoirs, &c., Act of 1896; subsiding reservoirs at Kempton Park, with filter-beds and a pumping-station; an equalizing reservoir at Cricklewood; a service reservoir at Fortis Green, Finchley; and the necessary connections with the Company's existing plant. The works are to be completed within fifteen years. Common land at Hounslow Heath, 1 acre 2 roods in extent, is proposed to be taken; the surface to be restored to its precedent condition. Sanction is sought for agreements between the Company and the Joint Committee constituted by the Act of 1896, with reference to the taking of water. Section 69 of the Act of 1896 is eventually to be repealed.

The Kent Water Board Bill proposes to constitute and incorporate a Water Board for the Urban Districts of Beckenham, Bromley, Erith, Bexley, and Dartford, the Rural Districts of Bromley and Dartford, and part of the Rural District of Sevenoaks; and to transfer to such Board the undertaking of the Kent Water-Works Company, and part of the undertaking of the Lambeth Water-Works Company. The constitution of the Board is defined. It is to consist of 24 members, with a Chairman who may be elected from outside and be paid. The undertaking of the Kent Company is to be sold to the Board within six months after the passing of the Act, for a price to be agreed on or determined by three Arbitrators, in the manner provided by the Arbitration Act, 1889. The price is to be the fair and reasonable value of the undertaking, together with allowance for cost of reinvestment. Every circumstance of the case is to be considered by the Arbitrators as fully and effectually as could be done by Act of Parliament. Back dividends are to be limited to six years. The Company's mortgage debt of £62,000 is to be taken over by the Board. The portion of the Lambeth Company's undertaking to be acquired by the Board is so much of it as is situated within the county of Kent. The Kent Company's Directors and officers are to be compensated. The Board are to supply water to the London district of the Kent Company; but in no event are the London County Council to supply water within the limits of the Board. The London portion of the Kent Company's undertaking may be sold to the London County Council. In addition to the purchase-money, the Board require £20,000 for water-works purposes. Surplus water profits are to go to the relief of the rates in the constituent districts.

Eight Bills are being promoted by the London County Council, with the object of obtaining powers to purchase the undertakings of the eight London Water Companies. These Bills are all on the same model. The part relating to the proposed transfer, in the first place authorizes the particular Company and the Council to enter into an agreement to this effect. With respect to arbitration in default of agreement, it is proposed that the Company shall be required to sell their undertaking to the Council within one year after the passing of the Act. At the time of serving the notice to sell, or at any time thereafter, the Council may also notify the Company that "unless the purchase-money for the undertaking be settled either by agreement or arbitration, and possession of the undertaking given before Dec. 25, 1897, the Council will require to enter into possession of the undertaking as on and from that day, or on and from Dec. 25, 1898; and such notice shall have the effect of vesting the undertaking in the

Council on and from the date so specified in the notice." In this event, the Council are to pay interest on the debentures held by such debenture-holders as shall not have accepted Metropolitan Consolidated Stock Annuities or other security in exchange therefor, and also the shareholders their dividend calculated on the average of the six preceding half years; these payments to continue until the amount of the purchase-money is settled. For the purpose of the arbitration, the Council and the Company may agree to the appointment of a single arbitrator or of three Arbitrators; or in default of agreement, each party may appoint an Arbitrator, and the third is to be appointed by the High Court. The Arbitrators may appoint Assessors. "The consideration to be paid by the Council for the transfer of the undertaking (if determined by arbitration) shall be such sum of money as the Arbitrators determine to be the fair and reasonable value of the undertaking, having regard to all the circumstances of the case; and in ascertaining such sum, the Arbitrators may consider all contentions which may be urged before them on behalf of the Council and the East London Company respectively as affecting the value of the undertaking, and shall not be precluded by any legal objection from entertaining any such circumstances and contentions, and may receive any evidence offered to them in support thereof, and shall have full power to deal with the same or any of them in such manner as they may, in their absolute and unfettered discretion, think fit. No sum in addition to such fair and reasonable value shall be awarded in respect of compulsory purchase, except that, in the event of no arrangement being made by the Council under which the money to be paid by them can be reinvested free of cost to the parties entitled thereto, the Arbitrators may award such further sum as in their opinion might fairly and reasonably cover the expenses necessarily attendant on the reinvestment of such money." The purchase of all the Companies' undertakings is to be proceeded with together, and on equal terms. Powers of inspection of the works and accounts are desired. No appointments or contracts made by the Company after Nov. 1, 1896, are to be valid against the Council, unless formally adopted in writing. The debenture obligations are to be taken over by the Council, subject to the power of cancellation of the stock at a determined value. Offices under the Company may be abolished, and the holders compensated; but nothing is stated concerning any compensation for the Directors. For the management of the undertaking after the transfer, there is to be constituted a Water Committee of 48 members, or of such other number divisible by 8, as shall be from time to time agreed upon between the Council and the Corporation of London; one-eighth to be appointed by the Corporation and the remaining seven-eighths by the Council. To this Water Committee is to be delegated, absolutely and without reference to the Council, all the administrative and executive functions of carrying on the supply of water, with the exception of purchasing or selling works, construction of works involving capital expenditure, the raising of money, and fixing or altering the domestic water-rates. The sinking fund held by the City Chamberlain is to be made applicable in aid of the purchase. Extra-Metropolitan portions of the water-works undertaking are to be saleable to the various Local Authorities. In the cases of the Water Companies interested in the Staines Reservoirs, &c., Act, 1896, provision is made for the transfer to the Council of the powers conferred upon these Companies by the Act.

The London County Council are also promoting a measure called the London Water-Works Purchase (Money) Bill, to authorize the expenditure of money for this purpose, according to the terms of the eight Bills. In order to raise the necessary funds, the Council desire power to create and issue consolidated stock or resort to the Consolidated Loans Fund. Annuities are to be issuable for the same purpose, for any period not exceeding 100 years. All capital raised in any form for the purpose of the Bill, is to be repayable within a period of not exceeding 100 years.

The Society of Gas Lighting and the Late Mr. Thomas.—At the January meeting of the Society of Gas Lighting, New York, a report was presented by the Committee, expressing the sentiments of the members upon the death of their former President, the late Mr. J. R. Thomas, who, during his twenty-five years' connection with the Society, had, they said, largely contributed to its development and usefulness. A resolution was passed conveying the sympathy of the members with Mrs. Thomas and the family in their bereavement.

The London Chamber of Commerce and the Secret Commission System.—Mr. Kenrick B. Murray, the Secretary of the London Chamber of Commerce, has notified through the Press that the Council have recently appointed a Special Committee to inquire into and report upon the subject of "the pernicious practice of giving and receiving secret trade commissions." A preliminary meeting was held on the 2nd inst., when Mr. David Howard, of Devon House, Buckhurst Hill, one of the Vice-Presidents of the Chamber, was elected Chairman, and Mr. Walter Hazell, M.P., Deputy-Chairman. In order that the Committee may have the fullest information before them, they will be willing to receive and consider confidentially any particulars bearing upon the subject which may be submitted to them through the Secretary. No names will be allowed to transpire, even in Committee, unless authorized.

COMMUNICATED ARTICLE.

SULPHATE OF AMMONIA.

By H. H. Cousins, M.A., South-Eastern Agricultural College, Wye.

[*All rights reserved.*]

III.—Effect of Sulphate of Ammonia on Plants.

The whole philosophy of manuring is bound up in three general principles—

(1) Nitrogen promotes general vegetative vigour—"growth."
(2) Phosphates promote fruiting and early maturity—"fruit."
(3) Potash promotes special productions—starch, sugar, flavours, or in short "quality."

All three are necessary; and though we are able to develop a plant in any definite direction by regulating its diet, it is extremely important to recognize the fact that nearly all crops both on the farm and in the garden give the most profitable results if manured with a mixture providing all the three plant foods.

Sulphate of ammonia must be recognized as an incomplete manure, and one only capable of yielding the best and most profitable result when fortified with a suitable addition of other plant foods. Its direct and obvious effect is to promote general growth and vigour. A young corn crop, dressed with sulphate of ammonia in the spring, rapidly develops a dark green colour; and the marked increase in the growth of a crop of oats, for instance, can often be seen a mile off. Lawes and Gilbert have found the average increase of a cereal crop treated with sulphate of ammonia to be one bushel of corn, and an equivalent amount of straw, for every 5 lbs. of ammonia added to the soil.

Manurial Value of Sulphate of Ammonia compared with Nitrate of Soda.

Theoretical Ratio.—Assuming that both the nitrate of soda and the sulphate of ammonia were chemically pure, and both capable of perfect assimilation by a crop, we should have the following ratio between the two manures: 100 lbs. of sulphate of ammonia = 128·8 lbs. of nitrate of soda.

Commercial Ratio.—Products of such extreme purity as this are never available for agricultural use; but if we take "24·5 per cent. ammonia" and "95 per cent. pure" as the standard purity of good commercial samples of sulphate of ammonia and nitrate respectively, we get a ratio between them which is practically identical with that existing between the purest products themselves—viz., 100 lbs. of sulphate of ammonia (24·5 per cent. ammonia) = 129 lbs. of nitrate of soda (95 per cent. pure).

Roughly speaking, we may say that sulphate of ammonia is slightly cheaper than nitrate of soda—nitrogen for nitrogen—when its price is 25 per cent. higher than that of the latter. From the point of view of chemical composition, a ton of sulphate of ammonia at £12 10s. is slightly cheaper than a ton of nitrate at £10.

Agricultural Ratio.—It is obvious to any thoughtful person that, in consequence of the great disparity in climate, soil, and season in the United Kingdom, any dogmatic statement as to the most remunerative manure for a given crop on a given soil is absolutely worthless and misleading. Manuring is, after all, but a gamble on the weather; and the wise man hedges judiciously, or so complicates his chances of success, that, although he may not stand to make the maximum profit, he is yet reasonably secure against complete disaster.

For more than forty years, the Rothamsted investigators have annually tested the comparative efficiency of nitrate and sulphate of ammonia; and their results show that, in years of extreme drought, nitrate has a marked and unusual superiority, while in very wet summers sulphate of ammonia proves itself the better stayer. Apart from these individual variations, it will be tolerably safe to accept the average results for forty successive seasons as giving the true comparative values for the two nitrogenous manures on the Rothamsted soils.

Results on Barley (per Acre).

	Dressed Grain. Bushels.		Straw. Lbs.		Total. Lbs.
43 lbs. of nitrogen as sulphate of ammonia + complete mineral manure	43½	..	2904	..	5365
43 lbs. of nitrogen as nitrate of soda + complete mineral manure..	45¾	..	3186	..	5761

This means an average return in favour of nitrate amounting to 4¼ per cent. of grain, and 9·7 per cent. of straw, or a total increase of the general crop amounting to 7·3 per cent.

The Rothamsted wheat experiments for forty years give 33⅜ and 35⅜ bushels per acre as the average yield from a complete manure with nitrogen as ammonia and nitrate respectively. This means a balance of 6 *per cent.* in favour of nitrate for wheat on Rothamsted soil.

Experiments on oats by the same investigators in 1869-73 gave results which favoured sulphate of ammonia by 3 per cent. A comparison of the *weight per bushel* of the cereal crops obtained

in these various experiments shows that the product of manuring with ammonia was heavier than that obtained by the use of nitrate. This amounted to 1¼ per cent. for wheat, 1½ per cent. for barley, and 3¼ per cent. for oats. Other investigations on this point have been conducted at Woburn by Messrs. Lawes and Gilbert and the late Dr. Voelcker; and the results vary considerably between themselves—in some cases nitrate appearing as 2 to 8 per cent. the more effective, and in others sulphate of ammonia apparently exercising even greater superiority. Heiden's experiments on oats favour ammonia to the extent of 4 per cent. in the yield of grain; and nitrate to the same extent in the yield of straw.

Wagner, experimenting on a calcareous soil with rye and buckwheat, obtained results with sulphate of ammonia which were about 2 per cent. greater than with nitrate, but other experiments show a result of 10 per cent. in favour of the latter. Experiments on sugar beet show that nitrate produces the heavier crop, but that sulphate of ammonia favours a higher percentage of sugar in the roots, and does not encourage so great an accumulation of saline impurities, and is consequently the better nitrogenous manure for the purposes of sugar manufacture. Lawes and Gilbert found the sugar produced with sulphate of ammonia to be 12 per cent. greater than that resulting from the use of nitrate. M. Dehérain found 15 per cent., and M. Joulie 16 per cent., under similar conditions. The German Agricultural Society found that far better results were obtained with sulphate of ammonia by applying 3 cwt. of slaked lime or 8 cwt. of powdered chalk per acre before putting on the sulphate of ammonia.

In summing-up the evidence obtainable on the comparative merits of nitrate and sulphate of ammonia, the following conclusions may safely be drawn:

(1) Apart from extreme variations in season, nitrate may be considered 5 per cent. more effective than sulphate of ammonia, but the latter should be bought in preference to nitrate when its price is not more than 20 per cent. higher.

(2) Given a soil with sufficient lime, sulphate of ammonia produces corn and roots of better feeding value than those obtained with nitrate.

(3) For hops, fruit, and garden use, sulphate of ammonia is preferable to nitrate because there is not so great a risk of over-dosing with soluble nitrates.

(4) Drought favours nitrate; a wet season tells decidedly in favour of ammonia.

(5) Prudent men will do well to apply both nitrate and sulphate of ammonia, as many experiments have shown that the same sum spent on the two manures gives, in an average season, a better financial return than when it is all expended on either alone. Applications of as little as ¼ cwt., per acre of sulphate of ammonia, and of as much as 4 cwt. have been applied to various farm crops as an addition to phosphatic and other manures, and have been found effective and remunerative. The whole may be put on at once, preferably in March or April, either alone, mixed with sand or earth to assist distribution, or in combination with superphosphate or potash salts.

Trade interests, persistent puffing and advertisement, have so effectively "boomed" nitrate as an agricultural manure, that there is grave risk that sulphate of ammonia, which possesses the additional merit of being a product of home manufacture, should be unfairly treated by the English farmer. Many agriculturists have been led to believe that nitrate has properties which place it in the highest position, quite apart from its market price. To all who are accustomed to use nitrate as an addition to their other manures, I would urge the careful consideration, in their own interests, of the facts stated here, and will close by again affirming that sulphate of ammonia costing 20 per cent. more than nitrate of soda is generally the cheaper and the more productive and profitable of the two.

Petroleum in Newfoundland.—The Engineers of a Petroleum Company who have been boring for oil at St. Paul's inlet have, it is reported, struck a splendid supply at a depth of 1040 feet; and the existence of a large petroleum district in the neighbourhood is considered certain.

The Derivation of the Word "Gas."—Some fresh light has lately been thrown upon the derivation of the word "gas." If we remember rightly, Dr. Murray has not yet reached the letter "G" in his "New English Dictionary;" and so we do not know what may be his views on the matter. Some dictionaries tell us that the term comes from the Anglo-Saxon "*gast*" or the German "*Geist*;" while others say it was invented by the Dutch chemist Van Helmont, who derived it from "*Geest*," the equivalent in his mother-tongue for our "spirit." According to a paragraph in the "Daily Chronicle," the question as to the origin of the word has been set at rest by Dr. Franz Harder, who has discovered a passage in the Latin text of the great physicist's works, of which the following is a translation: "I have, therefore, for lack of a name, applied with paradoxical licence to this new state of matter the term *gas*, which is not very remotely connected with the *chaos* of the ancients." As the "*Geest*" theory has been adopted by Littré, we agree with the writer of the paragraph that the point is worth noting.

TECHNICAL RECORD.

THE INCORPORATED INSTITUTION OF GAS ENGINEERS.

The Annual General Meeting of the above Institution was commenced last Saturday, at the Offices, No. 11, Victoria Street, S.W.—the PRESIDENT (Mr. William Foulis, the Chief Engineer of the Glasgow Corporation Gas-Works) occupying the chair. In addition, only four councillors and two members were present—the business to be transacted being, as usual on these occasions, of formal character.

CONFIRMATION OF MINUTES.

The SECRETARY (Mr. T. Cole) read the minutes of the annual general meeting held on Feb. 8 last year, and of the adjourned meeting in May; and they were confirmed.

ELECTION OF NEW OFFICERS AND MEMBERS.

The next business was the election of office-bearers and members; and the ballot-lists were handed to the Scrutineer (Mr. T. S. Lacey) for examination. He afterwards announced that the following gentlemen had been appointed to take office:—

President—Mr. Corbet Woodall, of London.

Vice-President—Mr. R. O. Paterson, of Cheltenham.

*New Members of Council**—Mr. C. E. Botley, of Hastings; Mr. T. May, of Richmond; and Mr. Fletcher W. Stevenson, of Sheffield.

Auditors—Mr. Magnus Ohren, of Sydenham; and Mr. Alfred Lass, of London.

* The other members of Council are: Mr. W. W. Fiddes, of Bristol; Mr. C. Gandon, Lower Sydenham; Mr. G. Livesey, London; Mr. A. C. M'Minn, Kensal Green; Mr. G. E. Stevenson, Manchester; and Mr. J. Young, Etruria.

Mr. Lacey also reported that the following names had been added to the roll:—

Members—Mr. H. P. Maybury, of Great Malvern; and Mr. Levi Monk, of Lewes.

Associate—Mr. F. M. Donne, of the Midland Railway Gas-Works, Derby.

On the motion of Mr. C. C. CARPENTER (Vauxhall), seconded by Mr. J. W. HELPS (Croydon), the Scrutineer's report was adopted.

The meeting was then adjourned to Wednesday, May 5, and the following day, at the Institution of Civil Engineers.

SOCIETY OF ENGINEERS.

The First Ordinary Meeting of this Society for the present year was held on Monday evening last week, at the Royal United Service Institution, Whitehall. Mr. S. H. Cox, the President for 1896, occupied the chair at the commencement of the proceedings, and presented the premiums for papers read during the past session. The President's Gold Medal was awarded to Mr. G. Thudichum, for his paper on "The Ultimate Purification of Sewage;" the Bessemer Premium to Mr. D. B. Butler, for his paper on "The Effect of Admixtures of Kentish Ragstone, &c., upon Portland Cement;" the Rawlinson Premium to Mr. W. G. Wales, for his paper on "Discharging and Storing Grain;" and a Society's Premium to Mr. M. A. Pollard-Urquhart, for his paper on "Examples of Railway Bridges for Branch Lines." Mr. Cox then introduced his successor, Mr. G. Maxwell Lawford, who proceeded to deliver his Inaugural Address. After briefly reviewing the work of the Society during the past year, the President drew attention to the steady reduction in the general death-rate of this country during the last fifty years, and the comparative freedom from zymotic diseases, both of which he attributed to the progress of sanitary science and the impetus given to the practice and study of hygiene by the Public Health and River Pollution Prevention Acts. The provision of pure water and efficient drainage was, he said, the duty of the engineer; and on these two subjects he based his address. After alluding to the discoveries of Pasteur, and the influence of biology in its relation to the purification of water, he contrasted the system of lake supplies, as instanced by the water undertakings of Glasgow, Manchester, Liverpool, and Birmingham, with the Metropolitan supply, which, coming from what he called "such polluted sources as the Thames and Lea," was entirely dependent for its bacterial purification on sand filtration. He further contrasted the successful municipal enterprise of the four cities mentioned with the working of the London Companies; finally expressing the opinion that the London supply should be managed in the consumers' interests by a body from which party and political feeling should be entirely excluded. A short description was then given of the Zurich Water-Works, which he had recently visited, and which are of exceptional interest to engineers by reason of the striking example they afford of "the conversion of the great sources of power in Nature to the use and service of man"—the river flowing from the lake being utilized not only to pump the entire water supply of the town, but to generate both hydraulic power

and electricity for lighting, motors, and traction. Drainage was then dealt with in its relation to water supply. In conclusion, the President stated that, in his opinion, no scheme of water supply could be considered complete unless it was supplemented by an efficient drainage system; and that, by devoting their attention to the hygienic requirements of all classes of the community, engineers contributed their share to the health, and consequently the prosperity, of the nation.

THE COMPOSITION AND TOXIC EFFECTS OF CERTAIN GASES.

In another part of the "JOURNAL" will be found an article dealing with two papers recently read before the Liverpool Section of the Society of Chemical Industry—one treating the subject of the apparatus to be used in the rescue of persons from noxious atmospheres; and the other on poisoning by carbonic oxide. The author of the second paper—Mr. Douglas Herman—gave several tables of analyses of gases containing this constituent, and showed its effect, as well as that of certain other gases, on man. It will be of interest to supplement the remarks in the article referred to by giving here some of the tables mentioned therein.

—	Producer Gases.					Blast Furnace Gases. Coke used.
	Siemens Open Grate.	Wilson Closed. Air injected with Steam.	High-Pressure Air and Steam Heated.		Mond.	
			Weak Gas.	Strong Gas.		
Methane (CH_4)	4·3	4·5	5·7	9·5	4·5	..
Carbon monoxide	23·4	24·6	28·0	27·0	8·7	28·4
Hydrogen	7·4	11·3	13·5	16·0	24·4	2·0
Carbon dioxide	4·2	4·3	1·0	2·0	15·6	7·1
Nitrogen	60·7	55·3	51·8	45·5	46·8	62·5
Combustible	36·1	40·4	47·2	52·5	37·6	30·4
Incombustible	64·9	59·6	52·8	47·5	62·4	69·6

—	Carburetted Water Gas, Purified.	Illuminating Gas (Retort) Purified.
Carbon dioxide	None	0·6
Oxygen	None	
Unsaturated hydrocarbons	10·7	3·2
Carbon monoxide	31·9	3·7
Saturated hydrocarbons	16·2	39·5
Hydrogen	33·7	49·9
Nitrogen	7·5	3·1

"After-Damp," Undiluted (Haldane).		Roughly Approximate Composition of Gases left along Track of Explosions in Coal-Pits (Based on Haldane).	
Nitrogen and argon	88·3	Carbon dioxide	5·00
Carbon dioxide	11·7	Carbon monoxide	1·25
		Oxygen	12·50
With variable quantity of CO.		Nitrogen and argon	81·25

Carbon Monoxide (CO).		Carbon Dioxide (CO_2).	
Per-centage in Air.	Effects on Man.	Per-centage in Air.	Effects on Man.
0·05	After half an hour or more, giddiness on exertion.	3·5	Breathing deeper.
0·10	After half an hour or more, inability to walk.	6·0	Marked panting.
0·20	After half an hour or more, loss of consciousness, and perhaps final death.	10·0	Severe distress.
1·00	After a few minutes, loss of consciousness and final death.	15·0	Partial loss of consciousness.
		25·0	Final death.

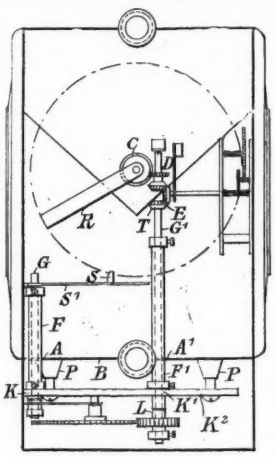
Fire-damp, or Methane (CH_4).		Oxygen (O).	
Per-centage in Air.	Effects on Man.	Per-centage present, remainder being N.	Effects on Man.
5·5	Nil.	17·3	Nil.
45·0	Breathing slightly deeper.	12·0	Breathing slightly deeper.
70·0	Life endangered.	9·0	Breathing deeper and more frequent. Face bluish.
		5·0	Loss of consciousness, and final death.
		0	Death with convulsions.

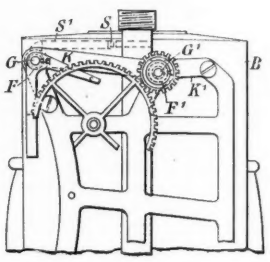
45 per cent. CH_4—		70 per cent. CH_4—	
O	11·5	O	6·3
N	43·5	N	23·7
CH_4	45·0	CH_4	70·0

REGISTER OF PATENTS.

Connecting Coin-Freed Apparatus to Gas-Meters.—Hollanders, E., of Southsea, Leather, C. J., of Portsmouth, and Taylor, T., of Southsea. No. 471; Jan. 7, 1896.

The patentees claim the arrangement illustrated and described below, for connecting coin-freed apparatus to fluid meters by means of tubes passed through holes made in the side of the meter; the tubes carrying shafts (adjustable therein by collars and set-screws) having, on their inner ends, stop and gear mechanism adapted to the registering mechanism of the meter, and on their outer ends means for connecting them to the fluid supply controlling and delivery regulating mechanism, so as to form a connection between the meter registering mechanism and the coin-freed apparatus.





The arrangement of coin-freed apparatus shown in the engravings—a plan and part end elevation of a gas-meter—is of the kind described in patent No. 17,621 of 1895.

Two holes A A^1 are made in the part B of the meter which encloses the registering mechanism C D E. Through each hole is passed a tube F F^1, in which is a shaft G G^1, adjustable by collars and set-screws or other means. On an arm S^1, fixed to one of the shafts, is a stop S for the radial arm R of the registering shaft C, or for otherwise stopping the registering mechanism; and fixed to the other shaft is a toothed wheel T, or other mechanism, whereby it can be geared to the wheel E or other mechanism actuating the registering part of the meter.

The method of attachment is as follows: The tubes F F^1, with the shafts G G^1 loose therein, are pushed through the holes in the side of the meter, until the stop S and gear T are in proper position. The end of each shaft outside the meter is then secured in its position by means of set-screws. The shafts and tubes are then entirely withdrawn from the meter; and the other end of each shaft is secured by fixing its collar thereto in a similar manner. After this, both shafts and their tubes are placed in their respective holes A A^1. The plate or frame K^2, having bearings K K^1 for the tubes F F^1 respectively, is then placed over the ends of the tubes outside the external collars, and over the ends of the pillars P. The frame is secured in position close against the collars by screws in the heads of the pillars. L represents a sleeve, which is secured to the shaft G^1 by a collar and set-screw, and which carries the first wheel of a train of clock mechanism forming part of the coin-freed apparatus properly secured to the outside of the meter. The stop-shaft G is also connected with the coin-freed mechanism by any suitable means.

Coin-Freed Mechanism for Gas-Meters.—Whitbread, S. J., and Griffiths, J. R., of King's Cross Road, N. No. 635; Jan. 9, 1896.

The patentees state that the object of their invention is "to arrange coin-freed mechanism in connection with a gas-meter which, when the mechanism is put in action after the reception of a predetermined coin, will continue in operation for the automatic collection of other similar coins which may have been put into the coin-receiver, each coin in succession being discharged into the till automatically."

The illustrations are a plan and front and end elevation of so much of a meter as is needed to explain the invention.

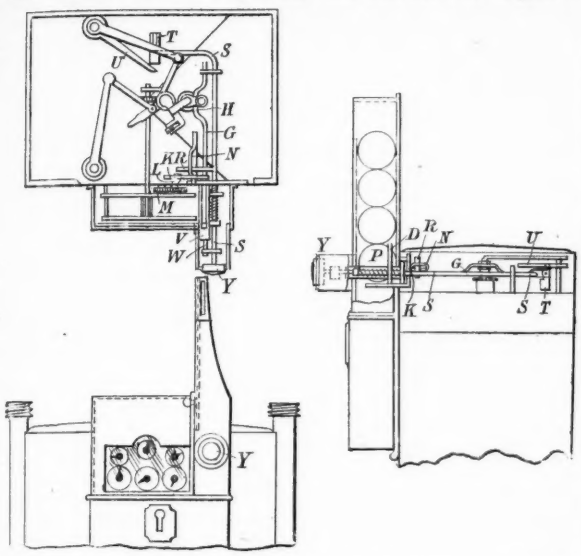
The appliance for receiving the coins as inserted is attached to a rod G, provided with a crank H, encircled by a couple of strips affixed to the stem of the lift-valve, which stops the passage of gas to the meter. The arm K projects in the path of a curved stud L, extending backward from the face of a toothed wheel M in gear with the ordinary index-operating wheels, and being operated thereby for the backwardly extending stud to lift the arm and close the gas-valve. The arm K can, however, be automatically pushed clear, as afterwards explained.

The arm K also has a looped projection N on one side, and on the other a pin P, bearing on a supporting-plate Q. The loop is arranged at an incline vertically; and an arm R of a second rod S is passed into it for being thrown up when the arm K is lifted. The rod S leads to the back of the meter-box, and its crook carries a slip-pawl T, against the tooth of which an arm U of the back flag wire can come in contact, when the determined quantity of gas is almost consumed, in order to draw back the rod S under power of the working bellows for the automatic discharge of each succeeding coin which has fallen into the receiver. The arm R in the loop of the projection N bears the weight of the crook and slip-paul T, and only partakes of a lift motion when the curved rod L comes round to lift the arm K.

The coin first passes into its cradle composed of the uprights D, and a sliding-piece V which can be moved to and fro without affecting the meter mechanism if no coin be therein. The sliding-piece has a

short rod W connected to the rod S, which has a button head, which can be pushed by hand to start the first coin for delivery and set the meter going.

The cycle of operation is as follows: A number of coins (say six) having been passed into the shoot, the person in charge pushes the button Y; and this causes the coin to abut against the end of the rod G. The arms K and R then take the end P off its ledge Q, and free of the crank L, giving a partial rotation to the rod G for the crank H to turn and open the valve for the passage of gas. This movement, by the connection of the crutch with the arm K, allows the operating coin to drop and to tilt forward the end F, so as to intercept and prevent the upper coins falling. In addition, the loop N (in dropping) takes the arm R with it, and partially rotates the rod S for the pawl T



to escape from the lever U. The coin having escaped enables the spring to return the rod S, and by the arm R, the loop N, and arm K are drawn back; the arm K being then within range of the stud L, which, as the wheel M is rotated by the meter mechanism, lifts the arm K and the pawl T into the path of the lever U—the valve gradually closing in consequence. During this movement, the crutch is returned to its normal position, and a fresh coin falls on the platform. The continued action of the meter causes the lever U to exert a push on the pawl T and rod S; and this, by drawing back the rod W and the fresh coin in place, removes the arm K back to clear the stud L and the end P from its ledge Q, so that the valve is re-opened automatically by this means. The valve never actually closes until all the coins have been discharged into the till.

Street Gas-Lamps.—Bellamy, C. R., of Liverpool. No. 760; Jan. 11, 1896.

This invention relates more particularly to street gas-lamps that have to be provided with burners with chimneys—such, for example, as incandescent burners.

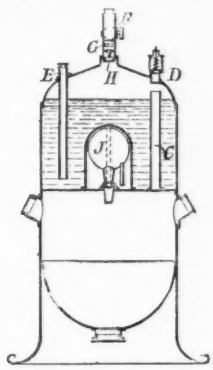
The lower portion of the lamp, of any suitable shape, is absolutely closed when the light is burning, but provided with a door for cleaning, repairs, &c. The air for combustion enters the lamp at the central part of the top, and is led by deflectors to the sides of the lamp. Above the portion of the lamp at which the air enters is a lighting-box, provided with a door, and with which the interior of the chimney surrounding the burner communicates by means of a metal chimney which forms a prolongation of the glass chimney. In this way, the air for combustion led into the lamp at the upper part is deflected to the sides, and then passes up to the burner; and the products of combustion travel up the glass chimney, through the metal prolongation, and into the lighting-box, from which they escape by the chimney. If the gas be turned on, it escapes up the chimney and into the lighting-box; and when the torch is inserted into the box, the lamp will, it is said, be lighted from above "without any liability of injury either to the mantle or the chimney."

Street-Lamp Fittings.—Bellamy, C. R., of Liverpool. No. 761; Jan. 11, 1896.

This invention has for its object the provision of means whereby at a certain hour the gas consumption in the public lamps may be reduced to any required extent. Each lamp would be provided with a cock, having one lower and two upper branches—all parallel and vertical; the two upper branches being connected to ports in the seating of the cock, which are diametrically opposite each other and at right angles to the port connected to the lower branch. The cock-plug has one through diametral passage and one radial passage at right angles to the diametral passage; the two passages forming a T-passage. A groove is formed round the plug, and connects the radial passage to the opposite ends of the diametral passage. The plug of the cock makes three-quarters of a revolution between its limiting positions; and it is provided with four arms adapted to be operated by the lamplighter's torch. When the cock is in one extreme position, both branches are cut off from the supply. On giving the cock a quarter-turn, the supply communicates with (say) the branch for the high rate of consumption; on moving the cock another quarter-turn, both branches communicate with the supply, and the burners on the one branch are lighted by those on the other branch; finally, when the cock is moved, through another quarter-turn, to the other extreme position, the supply communicates only with the branch for the low rate of consumption.

Generating Acetylene Gas.—Luis, C. G., of Denmark Hill, S.E. No. 1332; Jan. 18, 1896.

This apparatus—as shown in the engraving—consists of a generating vessel divided by a horizontal partition into two chambers, the upper to contain water, and the lower one calcium carbide The lower chamber is provided with charging apertures, and with an outlet for drawing off the residue from the calcium carbide. C is a pipe leading from the carbide chamber to a point above the surface of the water, and forming a communication by which the gas passes from the lower to the upper chamber. The upper chamber is provided with a safety-valve D, and with a charging-tube E. The latter extends downwards to a point below the surface of the water, and is furnished with an air-tight cap at its outer end. F is the gas-outlet pipe to the burners. Below the tap in the pipe are arranged a series of wire gauzes G, to prevent the



gas lighting-back, should the pressure within the apparatus become unduly reduced. A valve H is provided in the outlet-pipe F, to reduce the pressure of gas to the required amount. The automatic generation of the gas is effected by a floating valve, comprising a hollow metal ball J with a conical projection. The ball is furnished with a small downwardly-extending tube, open at both ends, and so arranged that, when the ball is in its lowest position, the lower end of the tube is nearly (but not quite) in contact with the partition. Curved bands are fixed to the partition, so as to prevent the ball rising too high in the water.

The ball, being filled with air, ascends to its highest position, and allows the water to pass gradually from the upper to the lower chamber; and the generation of gas will continue as long as the supply does not exceed the amount consumed. Should this not be the case, or should the tap be shut, the increased pressure within the apparatus will automatically close the valve, and stop the transference of water to the lower chamber, whereupon the generation of gas will cease. As the pressure of gas in the apparatus increases, the air in the ball becomes compressed, and a quantity of water rises into it, and decreases its buoyancy—causing it to descend, and shut off the supply of water to the calcium carbide. When the outlet-tap is again opened, and the pressure of gas in the apparatus reduced, the air in the ball expands again, and expels the water that had risen in the ball, and thus restores its buoyancy.

Incandescent Gas-Burners.—Lea, J. W., and Perrins, J. H., of Birmingham. No. 2298; Jan. 31, 1896.

This invention has reference to the bunsen burners of incandescent gas-lamps; the object aimed at being to so protect the open bottom of the shade holder that draughts cannot enter directly into the globe. The use of a chimney is thus rendered unnecessary.

The burner is provided with a gallery having a double cup, consisting of two concentric metallic shells—the cup occupying the bottom of the gallery. The shells are provided with series of perforations, through which air passes to the interior of the globe—the holes in the outer shell being opposite the unperforated parts of the inner shell. If the holes in the outer shell are formed by forcing the metal of the slots inwards, and thereby provide the holes with inwardly projecting tubes or flanges, and the slots of the inner shell are made by forcing the metal outwards, so as to form around the holes outwardly projecting tubes or flanges, when the two shells are put together to form the double cup, the air entering the globe has to pass through openings in the outer shell, and over the edges of the tubes or flanges around them, and then over the edges of the tubes or flanges of the openings in the inner shell, before entering the globe or shade. By this means, a steady ascending current of air is ensured on the outer part of the flame of the lamp.

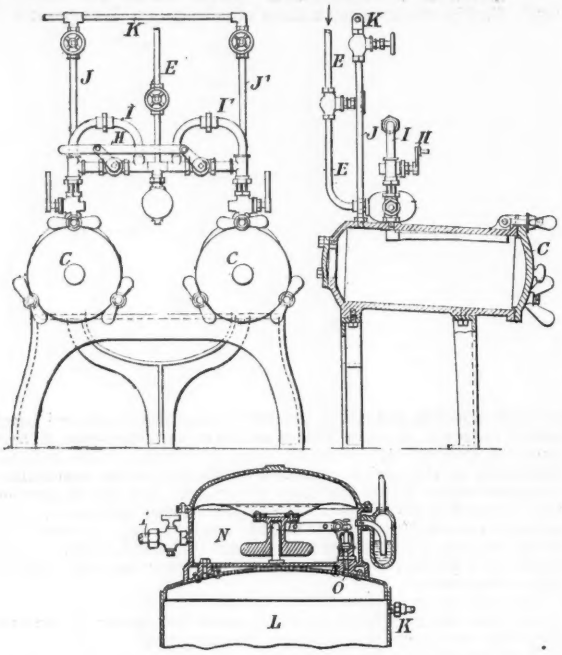
Manufacture of Acetylene Gas.—Pym, E. B., of South Kensington, and Gore, J., of Clerkenwell, E.C. No. 3219; Feb. 12, 1896.

This apparatus for the manufacture of acetylene gas consists of two storage chambers, into one of which the gas from the generator directly passes; while into the other the gas is admitted from the first chamber through a valve, the movements of which are controlled by a float or diaphragm moved by the gas in the second storage chamber.

The generator chambers [next page] are each provided with a cover C, fixed by bolts and nuts. The charges of calcium carbide are placed in baskets, so as to be introduced in, and removed from, the generator chambers with facility. E is the water-inlet pipe (containing a valve), provided with two branches leading to the generator chambers, and containing cocks, the levers of which are connected by a rod H in such a manner that when one is closed the other is opened. I I^1 are bye-passes, arranged above the cocks so that the level of the water has to rise before it can flow through them. J J^1 are the pipes through which the gas as generated escapes; the pipes being connected with a common pipe K, which leads to the storage chamber.

The operation of the apparatus is as follows: Assume the generator chambers to each contain a charge of calcium carbide, and the rod H

to be in the position shown. Water from the pipe E will flow into the left-hand generator chamber; and the gas given off will pass through the pipes J and K to the storage chamber. As the carbide becomes spent, the level of the water will rise in the chamber until finally it becomes so full that no more gas will be generated. The branch F then gradually fills with water, and the water also rises through the bye-pass I^1, and enters the right-hand generator chamber; so that gas making is only delayed for the short time that the branch F and the bye-pass I^1 are filling with water. The generation of gas in the second chamber will now go on, until the carbide in it is exhausted. Before this takes place, however, the attendant will have refilled the first chamber with carbide; and the operation proceeds as before.



As generated, the gas flows through the pipe K to the storage reservoir L (a portion only is shown). Fixed above this is a second storage chamber N, from which the gas (the pressure of which varies considerably in L) is delivered at a uniform pressure. O is the passage through which the gas enters; and Q is the pipe through which it passes to the burners. The top of the chamber N is formed of a flexible diaphragm, having fixed to its centre a weight R sliding upon a guide-pin. In the passage O is arranged a valve, around the stem of which is a spring, which tends to move the valve towards its seat; and in connection with the upper end of the valve-stem is a lever, which is operated by the weight to open the valve more or less, according to the position of the weight and the diaphragm. When the pressure in the chamber N is more or less relieved by the passing out of gas through the pipe Q, the diaphragm, with the weight, will drop to the position shown, so that the valve will be opened to allow the desired quantity of gas to enter the chamber.

Burning Rich Hydrocarbon Gases.—Wigham, J. R., of Dublin. No. 4285; Feb. 26, 1896.

This invention—the specification of the patent not being illustrated—consists in forcing the gas to the point of combustion through tubes with fine needle-hole outlets (of No. 7 size), through which the gas is emitted vertically or obliquely in straight jets—in contradistinction to fish-tail or batswing jets, which are frequently used with ordinary gas-burners. The straight jets of gas are either single, or (when used vertically or obliquely for lighthouse or other purposes where powerful lights are required) arranged in groups in such number as may be necessary for the size of light required. They are placed closely side by side, or concentrically, so as to cause the flame to have an appearance somewhat similar to that produced by an argand burner, but without the usual chimney glass surrounding the flame. Over each single jet or group of jets, is suspended a tube of mica, glass, or other suitable material, by which atmospheric air is sucked in by the upward current of air heated by the gas-jets, so as to render the flame smokeless and steady. The burner tubes are surrounded with a cover of perforated zinc, copper, or other material, conical in shape, and having a bottom of the same perforated material; the object aimed at being "to check the current of air to the tubes, and to impart to it before coming into contact with the flame a certain amount of heat, which is useful to the development of the light."

Recovering Cyanides from the Waste Products of Gas-Works.—Lewis, G. P., of Catford, and Cripps, F. S., of Sutton. No. 5184; March 7, 1896.

This invention relates to means for recovering cyanides not only from the effluent of gas-works ammonia stills, but it may also be applied to a liquor obtained in a manner to be hereafter described from spent oxide of iron, after doing duty as a purifying agent in the manufacture of coal gas.

Crude ammoniacal gas liquor, the patentees point out, consists of a variety of ammonium compounds, which are usually grouped into two classes—namely, those containing "free ammonia" and "fixed ammonia" respectively. The gas liquor is found to contain sulphocyanide and ferrocyanide of ammonia ("fixed" ammonium compounds), which are, in common with the remainder of this class, generally decomposed in distilling towers by the use of lime—the ammonia being set free, while the sulphocyanide and ferrocyanide combine with the lime to form sulphocyanide and ferrocyanide of calcium; or the use of an alkali, such as caustic soda, produces sulphocyanide and ferrocyanide of that alkali in solution in the effluent liquor, which is generally regarded as valueless.

The mode of carrying out this invention (there are no drawings attached to the specification) is as follows: The effluent liquor is caused to flow into a cooling-tank, where it is mixed with a solution of sulphurous acid or ferrous sulphate, and, overflowing through an interposed strainer, in order to clear it of lime in suspension, it is received into another tank, where it meets with a small stream of a solution of a copper salt, which precipitates the sulphocyanide present as insoluble white cuprous sulphocyanide. The supernatant liquor may then be run off as waste, if not otherwise required. The solution of sulphurous acid, or sulphurous acid gases, for treating the effluent liquor, can be obtained by passing "waste gases" through a furnace or kiln, suitably constructed and arranged for converting the contained sulphuretted hydrogen into sulphurous acid; the resulting products passing through a tower filled with bricks or coke, down which a stream of water trickles, absorbing the sulphurous acid and a portion of the other gases, and flowing thence into a cooling-tank. Alternatively, the effluent liquor may be passed through a scrubber. If the liquor is not treated with a reducing agent, such as sulphurous acid, before adding the solution of a copper salt, black cupric sulphocyanide is precipitated, which is partly soluble; whereas white cuprous sulphocyanide is insoluble. The precipitate of cuprous sulphocyanide is allowed to lie in the settling-tank until a sufficient accumulation has been obtained for further treatment. It is then washed, to remove impurities, and may be utilized for producing various sulphocyanides. Supposing ammonium sulphocyanide is required, it is exposed to the action of a liquid produced, as follows: The gases evolved in ammonia stills consist principally of ammonia, sulphuretted hydrogen carbonic acid, and steam; and they are generally passed through a saturator, where the ammonia is almost entirely absorbed by an acid, such as sulphuric acid, as in the well-known method of manufacturing sulphate of ammonia. The remainder, together with sulphuretted hydrogen and carbonic acid, pass up the outlet-pipe. These waste or foul gases are usually cooled by passing them through some form of condenser, which causes them to deposit a liquid which is sometimes almost in the condition of ammonium sulphydrate; but this state of things is not always attained. The liquid is therefore allowed to flow into a suitable form of gas-washer; and a stream of ammonia gas is passed through it, until the liquid is as nearly as practical in the condition of ammonium sulphydrate.

Waste gases of similar composition to the above are also evolved in the partial distillation of ammoniacal liquor, as in the well-known Hills's process of ammoniacal liquor purification, and may also be applied with the same object. Cuprous sulphocyanide is decomposed by ammonium sulphydrate into ammonium sulphocyanide in solution, and a precipitate of sulphide of copper. The ammonium sulphocyanide is separated by filtration, and may be obtained in the crystalline condition by evaporation.

Potassium of sodium sulphocyanide, and the like, may be produced as follows: Potassium or sodium hydrate, or carbonate, as the case may be, is run into the washer mentioned above; and a stream of the waste gases is passed into it, converting it principally into sulphydrate of the alkali employed. Potassium sulphydrate converts cuprous sulphocyanide into potassium sulphocyanide and sulphide of copper, as before. The solution of sulphurous acid for treating the effluent liquor may be obtained by passing the waste gases through a furnace, so constructed and arranged as to burn the sulphuretted hydrogen principally to sulphurous acid; the products passing through a coke-tower, down which a stream of water trickles, absorbing the sulphurous acid, and a portion of the other gases, and flowing into a cooling-tank for effluent liquor, as already described.

The process may also be applied to a liquor obtained from spent oxide of iron. The oxide is first freed from sulphur by any known methods; and it is then soaked in water and boiled with lime; the resulting liquor being run into a cooling-tank, and treated as explained.

Treating Coke for the Formation of Block Fuel.—MacKinnon, F. A., of South Kensington, W. No. 5916; March 17, 1896.

According to this invention, the patentee proposes to take coke as it comes from gas-retorts or from coke-ovens, and, after quenching with water in the ordinary way, to inject or force into it a spray of hot water or steam, holding in solution a binding material—such as glue, gelatine, or other cementitious substance. The coke thus treated is placed in moulds, and subsequently submitted to compressing action. The materials suitable for the agglutination of the coke are the common class of glues, the residuals from glue manufactures, also the residues from gelatine manufactures, bone and hide clippings boilers, &c. Convenient machinery for the purpose would consist of a spherical vessel revolved on its axis, into which the coke would be placed. During the rotation of the vessel, a spray of glutinous material would be introduced through the axis, combined with hot water or steam. When sufficient of the material had been introduced, the mixture would be placed in a mould, and subjected to the required compression.

Gas Stoves or Heaters.—Boult, A. J.; a communication from A. Wunderlich, of Brussels. No. 13,240; June 16, 1896.

The principal claims for this invention in gas-stoves and gas-heating apparatus are: 1. An arrangement of a bunsen burner in such a manner that, when it is lighted, there are two separate air suctions, one of which (the external one) supplies air to the mixing chamber, whereas the other (the internal) one supplies air to the regenerative chamber arranged on the top of the mixing chamber. 2. An arrangement of a bottom plate carrying the outer shell or casing and the whole of such a bunsen burner, and having two different series of holes corresponding to similar series of holes in moveable covers, mounted on the bottom plate in such manner that, by simply operating two handles, the admission of air either into the chamber for the external feeding of the flame, or into the chamber for the gaseous mixture, and into the regenerative chamber, may be regulated

independently of each other. 3. An arrangement of dome with axial chimney, for the escape of the combustion gases above the regenerator, in combination with a shell constituting an air-tight jacket, and resting on the bottom plate of the stove, in such manner that the upward and downward draught of the gas, air, and gaseous mixture is uniformly distributed round the centre or vertical axis of the jacket. 4. An arrangement of regenerative chamber constituted simply by a tube placed above the mixing chamber, and made of refractory material closed at the top and open at the bottom, so that the air entering into it from a pipe or tube arranged in the centre of the mixing chamber gets heated by the heat emitted by the interior of the flame, and enters into a space directly above the space corresponding to the place where the flame is originated. In this way, the quantities of heat which the air brings from the interior to the flame compensate for the quantities of heat which the air introduced to the flame from the exterior takes away in getting heated.

Gas Motor Tramcars.—Holt, H. P., of Chancery Lane, London. No. 18,851; Aug. 14, 1896.

This invention relates to the construction and arrangements of the engines and driving gear of a tramcar propelled by the combustion of gas stored under pressure in the car; the principal claim advanced by the patentee being for the combination with the underframing of the car of a pair of motor cylinders having their pistons connected to opposite cranks, or a shaft having a clutch by which either of two pinions of different diameters can be engaged with the crank-shaft. A first counter-shaft, having wheels of different diameters, gears with the pinions; a second counter-shaft, having a sliding clutch, engaging either of two wheels—the one gearing with a wheel on the first counter-shaft, the other with one of the pinions on the crank-shaft.

Burners for Incandescent Gas Lighting.—Bartlett, F. G., of Bristol. No. 23,454; Oct. 22, 1896.

This invention consists in means whereby a series of burners can be controlled by one main-tap, provided with a bye-pass arrangement. A valve is fitted in a chamber through which communication is made between a burner and the gas-supply pipe of such burner. Normally, the valve lies in its seat, and closes the communication; but when, by opening the tap, a sufficient pressure of gas is allowed to act from below on the valve, the latter is forced out of its seat, and gas flows to the burner. The gas thus supplied is ignited by a pilot-light supplied with gas through a channel not controlled by the valve, but controlled by the bye-pass of the main-tap. Communication between the burner and the gas-supply pipe remains open while the valve is kept raised; but when the pressure of gas acting from below on the valve is withdrawn by turning off the main-cock, the valve descends to its seat, and blocks the communication.

Air-Gas Apparatus.—Vriesland, A. I. van, of Amsterdam. No. 25,498; Nov. 13, 1896.

This apparatus is for producing gas or vapour from air, and such liquid hydrocarbons as have a specific gravity up to ·78, by forcing the air under pressure so as "to penetrate in a finely subdivided condition hydrocarbons of the kind described, or fabrics saturated therewith, in order to become saturated and escape as a combustible gas."

Fig. 1.

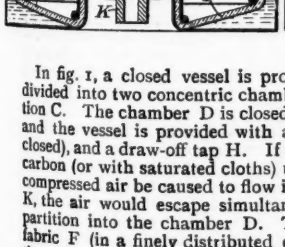
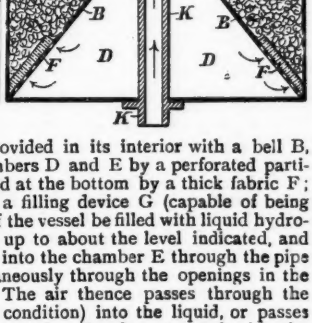


Fig. 2.



In fig. 1, a closed vessel is provided in its interior with a bell B, divided into two concentric chambers D and E by a perforated partition C. The chamber D is closed at the bottom by a thick fabric F; and the vessel is provided with a filling device G (capable of being closed), and a draw-off tap H. If the vessel be filled with liquid hydrocarbon (or with saturated cloths) up to about the level indicated, and compressed air be caused to flow into the chamber E through the pipe K, the air would escape simultaneously through the openings in the partition into the chamber D. The air thence passes through the fabric F (in a finely distributed condition) into the liquid, or passes through the saturated cloths; becoming thereby saturated with the hydrocarbon, and rising upwards in order to be conveyed to the place of consumption as a combustible compound. The perforated cover L prevents the liquid spurting out in case of too strong an air pressure.

A modified form of apparatus is shown in fig. 2, which in practice is to be preferred, as it renders it possible to evaporate the hydrocarbon to the last drop. In order to attain this end, an inverted cone or funnel B is inserted in the vessel to form an air chamber D, to which air is conveyed through the pipe K. The funnel is provided in its lower part, up to a certain height, with perforations, and covered at this part with a fabric F. If the vessel be filled with heavy hydrocarbon (or a material saturated with it), and air be conveyed to the chamber D, this air has a tendency to escape through the holes at the lower end of the funnel, and thereby penetrate the pores of the fabric. It then enters the lower part of the hydrocarbon in a finely-distributed condition, and at a somewhat higher temperature, in consequence of the resistance experienced in the fabric; and, rising upwards, becomes saturated, and escapes as combustible gas or vapour.

APPLICATIONS FOR LETTERS PATENT.

1254.—Moss, R. J., "Generating and purifying acetylene gas." Jan. 18.
1286.—Burgess, J. F., "Atmospheric gas-burners." Jan. 18.
1287.—Burgess, J. F., "Illuminant appliances for gas and other burners." Jan. 18.
1360.—Wright, E., "Gas Motors." Jan. 19.
1370.—Bartlett, F. G., "Incandescent gas-lighting." Jan. 19.
1393.—Bibbero, M. F. S. M., and Bailey, J. C., "Atmospheric gas-burners." Jan. 19.
1398.—Addicks, W. R., "Manufacture of carburetted water-gas." Jan. 19.
1400.—Dougill, J., "Gas and other engines." Jan. 19.
1402.—Hunter, J. W., "Gas or oil engines." Jan. 19.
1412.—Wimshurst, J. E., "Gas and vapour engines." Jan. 19.
1429.—California Prepayment Meter Company and William, H. W., "Prepayment attachments for meters." Jan. 19.
1440.—Boult, A. J., "Generation of gas." A communication from H. F. Fuller. Jan. 19.
1490.—Baldwin, G., "Manufacture of acetylene gas." Jan. 19.
1501.—Deffek, A., and Kohn, J., "Holders or supports for the mantles of incandescent gas-burners." Jan. 19.
1528.—Ingham, W., and Langton, B., "Dies and centres for making inclined or tapered fire-clay retorts, &c." Jan. 20.
1549.—Sterza, A., "Preparing or rendering acetylene gases fit for heating purposes." Jan. 20.
1598.—Winton, A., "Explosive engines." Jan. 20.
1633.—Guyan, A. J., "Simultaneous gas-lighting arrangement." Jan. 21.
1694.—Winton, A., "Explosive engines." Jan. 21.
1695.—Winton, A., "Explosive engines." Jan. 21.
1776.—Pond, C., and Richards, R. S., "Manufacture of calcium carbide." Jan. 22.
1777.—Denayrouze, L., "Burners for incandescent gas lights." Jan. 22.
1784.—Thompson, W. P., "Generating and burning acetylene gas." A communication from A. Gobron. Jan. 22.
1817.—Archer, H. W., and Barrett, S. R., "A bunsen burner with improved pilot light." Jan. 23.
1843.—Boult, A. J., "Mixing or separating gaseous bodies in solution with or from other bodies." A communication from H. H. Dikema. Jan. 23.
1860.—Nagel, A., "Incandescent gas-light burners." Jan. 23.
1863.—Döhner, R., "Bunsen burners for incandescent gas-lamps." Jan. 23.
1879.—Troisier, A., "Generating acetylene gas and regulating its production." Jan. 23.
1896.—Dunlap, F. W., and Quain, J. R., "Light refracting and magnifying envelopes, shades, and globes." Jan. 23.
1905.—Simmance, J. F., "Gas-lamps." Jan. 25.
1923.—Romocki, S. J. von, and Ascher, H., "Incandescent gas-burners." Jan. 25.
1929.—Thorp, T., and Marsh, T. G., "Production of acetylene from calcium carbide." Jan. 25.
1933.—Hastings, H. M., "Gas-fittings." Jan. 25.
1952.—Mewburn, J. C., "Generating gas by the reaction of solid substances with water or other liquid, especially applicable to the generation of acetylene gas by contact of water with metallic carbides." A communication from A. M. Scott. Jan. 25.
2032.—Lyons, T. & J., and Pearson, J., "Acetylene gas store generators." Jan. 26.
2036.—Chesterton, W. J., "Supporting hanging gas-lamps." Jan. 26.
2039.—Pettersson, C., "Electrically operated gas-burners." Jan. 26.
2050.—Kaestner, C., "Burner for use with acetylene gas." Jan. 26.
2062.—Claus, C. F., "Incandescent gas-lamps." Jan. 26.
2065.—Boult, A. J., "Production of acetylene gas." A communication from C. Benoit and A. Gravière. Jan. 26.
2110.—Wolff, L., "Incandescent gas-lamp." Jan. 26.
2113.—Spurge, J., "Gas cleansing apparatus." Jan. 26.
2123.—Martindale, M. D., "Motors operated by fluid or gaseous pressure." Jan. 26.
2129.—Wise, W. L., "Manufacture of gas." A communication from A. Piatti and Co. Jan. 26.
2146.—Tee, H., "Incandescent gas lamps or burners." Jan. 27.
2190.—Killing, C., "Incandescence mantles." Jan. 27.
2241.—Nehmer, H. & F., "Incandescent gas lights." Jan. 28.
2256.—Robinson, S. J., and Pope, S., "Gas-heated steel melting furnaces." Jan. 28.
2284.—Carter, R. F., "Production and storage of acetylene gas." Jan. 28.
2288.—Borchardt, H., "Automatic lighting device for gas-burners." Jan. 28.
2292.—Sales, G. de R. de, "Generating and storing acetylene." Jan. 28.
2337.—Crees, G. W. B., "Producing acetylene gas." Jan. 28.
2341.—New, A. G., "Explosion engines." Jan. 28.
2342.—New, A. G., "Explosion engines." Jan. 28.
2364.—Tully, C. B., "Gas and other pipes." Jan. 29.
2428.—Bean, H. R., and Ringwood, H., "Generator, condenser, and holder for acetylene and other gases." Jan. 29.
2452.—Baker, E., and Newey, J. H., "Improvements in gas-engines." Jan. 29.
2456.—Sandwell, W. D., and Evans, J. G., "Explosion engines." Jan. 29.
2461.—Glover, R. T. & J. G., "Coin-freed gas-meters." Jan. 29.
2486.—Thwaites, R. G., "Gas-iron." Jan. 30.
2511.—Holmes, T. & G. S., and Stewart, R. W., "Production of inflammable gas." Jan. 30.
2551.—Gilligan, J., "Mantles for incandescent lighting." Jan. 30.
2554.—Villejean, E. G., and Frossard, H. J. J., "Generation of acetylene gas." Jan. 30.

CORRESPONDENCE.

[*We are not responsible for the opinions expressed by correspondents.*]

Carburetted Water Gas and Carbon Monoxide.

SIR,—The comparative safety and entire suitability of carburetted water gas for general distribution having been demonstrated by twenty years' experience on the North American Continent, where to-day it constitutes 70 per cent. of the total quantity of illuminating gas manufactured, and by more recent adoption in thirty of the principal cities of the United Kingdom, corroborated by varied and indisputable scientific authority,* the attempt to rehabilitate the carbon monoxide superstition hardly calls for serious consideration. History may repeat itself; but fallacy gains nothing from anachronism.

It is, however, really interesting, and to those not conversant with the situation, it will be surprising, to note the infinitesimal nucleus of fact upon which the "agitation" at Garston was based.

Absolutely pure carburetted water gas, such as lights the most populous cities of America, has been distributed throughout the wide area supplied by the Garston works for the past two years—much of that period apparently without the recognition of the consumers. Since its use, two (and only two) fatal accidents have occurred. In the first instance, the gas burning in a bedroom occupied by an old woman was extinguished by being turned off for a few moments at the meter. The door being locked, the room was not entered until the following midday. The woman lived for nearly a week; and the Coroner severely censured the householders for gross negligence. In the second case, a workman having retired for the night, rose and complained to his landlady that he was unable to sleep on account of the smell of gas in his room, in which there was no gas fitted for use. The man, however, subsequently returned to bed with his wife. The woman, on getting up some two hours later than her husband's usual time, while dressing, discovered him, fully dressed, lying dead on the floor. She experienced no inconvenience; and the autopsy showed that the man had fatty degeneration of the heart.

While upon the latter of these culpable incidents a local newspaper has endeavoured to inaugurate a crusade against carburetted water gas, its own columns should have recorded the contemporary intelligence that, under precisely similar circumstances of external leakage to those at Garston, where one of two people sleeping together was not even affected, both persons in each case at Cork and Drogheda were found dead by coal gas.

Eminent scientists are, by virtue of advanced knowledge, guarded and moderate in their opinions. Hence their common pronouncement upon this question, confirmed by the practical revolution of a great industry, can hardly be disturbed by the technical contributions of those who have read in a text-book that carbonic oxide is a dangerous poison.

It is now recognized, by those thoroughly conversant with the subject, that the use of carburetted water gas actually promotes health, by reason of its comparative freedom from deleterious impurities, and the lesser vitiation of the atmosphere owing to the reduced products of combustion.

Westminster Chambers, S.W.,
Feb. 8, 1897. HUMPHREYS AND GLASGOW.

Choked Ascension-Pipes.

SIR,—I should like to thank "J. A. F." for his very instructive contribution to the above subject in last Tuesday's "JOURNAL," on one or two points in which I should like to offer some remarks. It is plain to me that blocks occur through uneven heating of the settings, high heats, tapered pipes, and poor coal. In our case, in settings of eights, the two centre retorts have been a great trouble, these being very much hotter than the others. This, in my opinion, occurs through badly arranged settings; and perhaps it is the case in other works. No matter how one tries to adjust primary and secondary air, it is always the same. The gases and liquids passing off from a charge are heaviest about the second hour; and with high heats and heavy charges at this time, the volume of gas and tar, &c., is too great for the capacity of the pipe. With a tapered pipe, it is baffled in its passage; and the liquid trickles down the pipe until it is dried by the heat. This goes on till the pipe becomes choked; and the gas is spoiled by its long contact with the heat. I have never been able to see any advantage in tapered pipes—in fact, I think them a mistake. For some time we have worked on similar lines to those advised by "J. A. F."—slightly lower heats, lighter charges, and drawn as recommended by him. The result has been very agreeable—no stopped pipes, and better gas.

Feb. 5, 1897. FOREMAN.

The Berlin Tests of "Holophane" and "Fredureau" Diffusing Globes.

SIR,—Having read with interest the article on the above subject in your issue of the 26th ult. (p. 181), we trust you will allow us to offer a few remarks in order to clear up a misconception of the true facts.

It should be known by all those who are interested in this subject that the "Holophane" with which the experiments were carried out was a bulb-shaped globe 6 inches high; whereas the "Frédureau" experimented with was merely a hemispherical glass 3 inches high, with 14 canulations. It will therefore be evident that tests under these unequal conditions are quite impossible, if a satisfactory and just conclusion is to be arrived at. Moreover, the "Frédureau" globe was one designed for office purposes—to throw a powerful and concentrated light over a very limited area. It is for use under a paper shade, to act as a sort of improved eye-screen that protects the eyes from the glare of the mantle while at the same time increasing the power of the light immediately below it, for writing or reading. This pattern was therefore quite unsuited for street lighting requirements, and should never have been used for the purpose.

On the other hand, had our patent "Projector," which is specially designed for effecting a more even distribution of light in streets, by throwing rays at a considerable distance, been employed, a very different result would have been obtained from the comparisons, as is proved by the investigations by Professor Silvanus Thompson, D.Sc., F.R.S., of the special powers possessed by the "Frédureau" globe over a source of light.

Feb. 4, 1897. A. & E. COHEN.

* See "Carburetted Water Gas and Carbonic Oxide," a pamphlet by Messrs. Humphreys and Glasgow.

Standard Meter Unions.

A correspondent, writing upon the above subject, calls attention to the fact that at the close of the report presented by the Research Committee of the North British Association of Gas Managers at the meeting of the Association last July there was a recommendation that the standard sizes of couplings determined upon in conjunction with representatives of meter makers, and set forth in the report, should be adopted as from Jan. 1, 1897. He states that application has been made to the Edinburgh meter makers for meters with "Association unions," and they have been unable to supply them; the reason assigned being that there is a probability of the Board of Trade legalizing a set of standard unions which they have had made, and which are now in use in England. In view of this fact, our correspondent remarks that it would be interesting to know what progress has been made towards the realization of the recommendations of the North British Association Committee, as it would be regrettable if their useful labours should come to nought.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF LORDS.

As the result of the usual conference between the Chairman of Committees of the House of Lords and the Chairman of Ways and Means of the House of Commons, the following Bills in which our readers are interested were to originate in the Upper House:—

Belfast Water Bill, Caerphilly Urban District Council Bill, Carnarvon Corporation Bill, Clydebank and District Water Bill, Cowes Gas Bill, Deal and Walmer Water Bill, Eastbourne Corporation Water Bill, Eastbourne Water Bill, Fylde Water (Transfer) Bill, Gravesend and Milton Water Bill, Gravesend and Northfleet Water Board Bill, Gravesend Corporation Water Bill, Harrogate Corporation (Water Transfer) Bill, Harrogate Water Bill, Hunstanton Water and Gas Bill, Loughborough Corporation Bill, Lowestoft Corporation Bill, Lowestoft Water and Gas Bill, Malvern Link Urban District Gas Bill, Malvern Urban District Gas Bill, Newhaven and Seaford Water Bill, New Hunstanton Water and Gas Bill, Newport Corporation Bill, Rhymney and Aber Valleys Gas and Water Bill, St. Anne's-on-the-Sea Gas Bill, Southampton Corporation Water Bill, Stirling Burgh (Gas) Bill, Swansea Improvements and Tramways Bill, Taunton Gas Bill, Torquay Corporation Water Bill, Tynemouth Corporation Water Bill, Tynemouth Gas Bill.

On Friday, all the Bills in the above list, with the exception of the Gravesend Corporation Water Bill, the Southampton Corporation Water Bill, the Stirling Burghs (Gas) Bill, and the Swansea Improvements and Tramways Bill, were presented and read the first time.

HOUSE OF COMMONS.

The following Bills were to originate in the Lower House:—

Arundel Gas Bill, Ashford Gas Bill, Ashford Urban District (Gas) Bill, Bolton Tramways and Improvement Bill, Chelsea Water (Purchase) Bill, Chichester Corporation Water Bill, Colne Corporation Bill, Crays Gas Bill, Crowborough District Water Bill, Devonport Water Bill, Dublin Corporation Bill, Dumfries and Maxwelltown Water Bill, Dundee Corporation Bill, East London Water Bill, East London Water (Purchase) Bill, East Warwickshire Water Bill, Edinburgh Corporation Bill, Grand Junction Water (Purchase) Bill, Huddersfield Corporation Bill, Kent Water Board Bill, Kent Water (Purchase) Bill, Kingston-upon-Hull Corporation Bill, Lambeth Water (Purchase) Bill, Leeds Corporation Bill, Leicester Corporation Bill, Llandudno Urban District Council Bill, London Water (Purchase) Bill, Luton Water Bill, Manchester Corporation Bill, Newark Corporation Water Bill, New River Company Bill, New River Water (Purchase) Bill, Nottingham Corporation Water Bill, Perth Improvements Bill, Pwllheli Corporation Bill, St. Neot's Water Bill, Salford Corporation Bill, South Metropolitan Gas Bill, Southwark and Vauxhall Water (Purchase) Bill, Swadlincote District Gas Bill, Tuxford and District Gas Bill, West Middlesex Water (Purchase) Bill, Weymouth Gas Bill, Weymouth Water Bill.

All the Bills in the above list, with the exception of the Bolton Tramways and Improvement Bill and the nine Water Bills promoted by the London County Council, were presented on Friday, and read the first time.

A Bill to make better provision for workmen injured in the course of their employment was brought in last Tuesday by Sir A. Forwood, Sir E. Hill, Mr. Warr, and Mr. Tomlinson, and read the first time.

On Thursday, Sir C. Gull asked the President of the Local Government Board whether his attention had been called to the fact that, though statutory obligations were imposed upon Rural District Councils in respect of the supply of water to places within their districts, it had been often found practically impossible for those Councils to carry out their obligations in the absence of powers of compulsory purchase; and whether he could introduce at an early date a short measure enabling Rural District Councils to compulsorily acquire water rights. Mr. Chaplin replied that he had already caused the point to be noted; but he could not undertake to bring in a Bill this session, nor could he say there was any immediate prospect of one being introduced.

LEGAL INTELLIGENCE.

SUPREME COURT OF JUDICATURE—COURT OF APPEAL.

Thursday, Jan. 28.

(*Before Lords Justices* LINDLEY, A. L. SMITH, *and* RIGBY.)

Andrews v. The Gas-Meter Company, Limited.

This was an appeal by Mr. Henry Finlay from an order made by Mr. Justice Kekewich on the 30th of July against the preference shareholders, of whom the appellant was the appointed representative. The Company had been very successful, having paid 17½ per cent. The action was a friendly one, brought by an ordinary shareholder to obtain the decision of the Court on the question whether the preference shareholders were entitled to participate in a sum of £35,000 transferred from the reserve account to revenue, and proposed to be divided as profits. The preference shares were issued in 1865; and a dividend of 5 per cent. had been paid upon them ever since. In the Court below, the case presented on behalf of the preference shareholders was that the preference was not validly created, and that they were entitled to share in the profits as ordinary shareholders. Mr. Justice Kekewich took the view that the preference was invalid; but he also held that the class represented by Mr. Finlay were not shareholders at all.

Mr. WARRINGTON, Q.C., and Mr. WRIGHT now argued, first, that the bargain made when the preference shares were created was solid and binding, in which case the £35,000 would be distributed among the ordinary shareholders; and, secondly, if the preference was invalid, then the holders of preference shares were members of the Company, and entitled to be treated as ordinary shareholders.

Mr. LAWRENCE, Q.C., and Mr. EUSTACE SMITH now submitted that there was nothing on the face of the Articles of Association that expressly authorized inequality of shares.

At the conclusion of the arguments, judgment was reserved.

Saturday, Feb. 6.

Judgment was delivered this morning.

Their LORDSHIPS held that the resolution under which the preference shares were issued was *intra vires;* and therefore the appeal would be allowed.

It was mentioned by Counsel that the question of costs had been arranged between the parties.

HIGH COURT OF JUSTICE—CHANCERY DIVISION.

Tuesday, Feb. 2.

(*Before Mr. Justice* STIRLING.)

The Incandescent Gas-Light Company, Limited, v. The New Incandescent (Sunlight Patent) Gas Lighting Company, Limited.

This was a motion which came before his Lordship, sitting for Mr. Justice Kekewich, on the 28th ult. (see *ante*, p. 236).

Justice STIRLING, in giving his reserved judgment, said this was a motion on behalf of the plaintiffs to restrain the defendants from continuing the issue of a certain advertisement which appeared in the "JOURNAL OF GAS LIGHTING" on Dec. 1, 1896. The portion of the advertisement which the plaintiffs complained of was as follows: "The Sunlight Company are owners of the Rawson process for stiffening mantles for transport. An action against the Welsbach Company for infringement of this patent will shortly be heard, and, we are advised, will establish the validity of the patent, and render all users of their mantles liable to proceedings at law, and all stocks of such mantles liable to be destroyed by order of the Court." The defendants in this action were not the Sunlight Company mentioned in the advertisement; and the first question to be considered was what their relation to that Company was. In an affidavit sworn by the Secretary of the defendant Company, it was stated that the Sunlight Company had granted to the defendant Company an exclusive licence to work the patent. As he (his Lordship) was not quite satisfied with this statement, he asked to see the document, and it had been put in evidence. It was dated the 4th of May, 1896, and was a contract between the Sunlight Company and Mr. Belcher, as trustee for the Company, afterwards to be formed (the defendant Company), who adopted the contract, for the sale by the Sunlight Company to the defendant Company of certain things. It recited that the vendor Company were possessed, as beneficial owners, of certain letters patent, and had commenced an action against the Incandescent Gas-Light Company, Limited, in respect of infringements of that patent. That was the action referred to in the advertisement. The vendor Company agreed to sell, and the purchasing Company to buy, all plant, machinery, and apparatus belonging to the defendant Company used by them in the manufacture of certain incandescent gas-light apparatus. The vendor Company undertook, at their own cost, to go to trial with the action which had been commenced against the Incandescent Company, and to carry it to the House of Lords, if necessary, and from time to time to consult the Directors of the purchasing Company with respect to any steps to be taken in the matter. Then, within a week after the settlement of the pending action, the vendor Company were to give the purchasing Company notice in writing thereof; and the purchasing Company were to have the option of purchasing the letters patent. Then it was provided that the vendor Company should not enter into voluntary liquidation until the purchasing Company had had the opportunity of exercising the option of purchasing the letters patent; and until that option had been exercised, the vendor Company were not to grant any licence to use the patent without the consent of the purchasing Company. In the event of their not purchasing the patent, the defendants were to pay a royalty of ½d. for each mantle in respect of all mantles manufactured by them as from the 16th of May, 1896, up to the date of their so failing to exercise the option. The question was what the defendants' position was under this agreement. In the first place, it was very remarkable that the contract did not grant, in express terms, a licence to use the patent in question; but, having regard to the last clause, it seemed to him that it was necessarily implied. The meaning of the clause was that, as from the 16th of May, 1896, the defendant Company were to be at liberty to use the invention upon the terms that, if they exercised the option to become purchasers of the patent, they should not pay anything for so doing; but if they did not exercise the option, they were to pay a stipulated royalty. Therefore they were licensees. Secondly, inasmuch as there was a stipulation that, until the option was capable of being exercised, the vendor Company should not grant any licence without the consent of the purchasing Company, and it was not alleged that any such licence had been granted, they were in a sense exclusive licensees. Whether they were so in the sense of being able to prevent the vendor Company from themselves manufacturing was a very different question. Possibly they might not be so entitled; but, seeing that the agreement was one for the sale of the business as a going concern, the question whether the Sunlight Company could so manufacture or not was probably purely academical. The question then arose whether the defendants could be restrained from issuing such an advertisement. There were two grounds on which the plaintiffs might succeed—under the statutory provision of section 32 of the Act of 1883, or by reason of the common law rights they might have. Assuming that section 32 applied, what was the position of the defendants? They were not the actual owners of the patents—they were merely licensees with an option to purchase; and the only way in which they could bring an action was by calling on their vendors to enforce their legal rights against infringers. This they could do; and the Court was informed that such an action had already been begun, and would come on for trial during the present month, by the New Sunlight Company against the present plaintiffs. It seemed, therefore, that the condition of the proviso to the section applied, and that no injunction ought to be granted under that section. Next, were the plaintiffs entitled to an injunction because the defendants were infringing their common law right? On this point, the case of *Halsey v. Brotherhood* was directly in point. This case established that an injunction might be granted where an action for damages would lie at common law. But in order that such action might lie, the statement complained of must not only be made out to be untrue, but must be made in bad faith. So that these two ingredients were essential—first the falsity of the assertion, and, secondly, the want of good faith. He, therefore, turned to the case before him to see, first of all, whether the statement which had been made was false, and, secondly, whether it was made in bad faith. As to the first point, the statement was: "An action against the Welsbach Company for infringement of this patent will shortly be heard." That was true. The advertisement went on, "and we are advised, will establish the validity of the patent." This was an expression of opinion, and there was no reason to doubt the truth of it. Then came the part principally complained of, "and render all users of their mantles liable to proceedings at law, and all stocks of such mantles liable to be destroyed by order of the Court." Was this true or false? As a matter of verbal criticism, possibly exception might be taken to it. The sentence in question appeared to say that the present pending action would render all users of the mantles liable to certain penalties. But it would not do this. The question in such a case as this was not whether the statement was literally true, but whether it was true in substance and in fact; and it appeared to his Lordship that it was. The meaning of the sentence was that, if the action succeeded, the validity of the patent would be established; and that, by reason of the patent being held to be valid, all users of the mantles made by the infringing Company would be liable to proceedings at law, and to have their stocks destroyed by order of the Court. There was thus an end of the case, because, the statement being true, he saw no answer to the argument that the defendant in such a case was entitled to justify his statement by its truth; just as in an ordinary action of libel the plea that the statement was true in substance and in fact would be a complete answer. Supposing that he was wrong in this, and that the strict construction was to be put on the sentence, then the question arose: Was it made in bad faith? On this point, the question of interest or no interest was of importance. The Lord Chief Justice had decided that, if a statement was made by a defendant in defence of his own property, though it was untrue, it was still a privileged statement, unless express malice was proved—that was to say, the want of *bona fides* or the presence of *mala fides*. It was entirely different if the person who made the assertion had no interest, because then he was a person meddling with things that did not concern him. If this was not in itself evidence of malice, at all events it raised a strong presumption against him; and a very little more would be sufficient to show that the statement was not made *bonâ fide*. Had the defendants in the present case an interest? It had always been held in actions with reference to slander of title that the interest spoken of need not be a present vested interest. He was of opinion that the defendants had an interest; but it was said that until the patent was vested in them they had no rights with respect to it. It might be that the defendants would never become assignees of the patent, nor be entitled to recover damages in respect of infringements; but the advertisement was directed to what would happen when the trial was over. There was no ground for the motion, and it would be refused. The costs would be costs in the action.

Saturday, Feb. 6.

(*Before Mr. Justice* NORTH.)

The Incandescent Gas-Light Company, Limited, v. Dolski—Same v. Dunn.

In this action, which came before the Court upon motion for judgment in default of defence, the plaintiffs sought to restrain infringement of their patents of 1885 and 1886. The statement of claim alleged infringement, and the granting of a certificate by Mr. Justice Romer of the validity of the patents.

Mr. WALTER appeared for the plaintiffs.

Justice NORTH granted an injunction and an inquiry as to damages; and he ordered delivery up of the infringing mantles, and payment of the costs as between solicitor and client.

A similar order was made against H. Dunn, in default of appearance.

COUNTY OF LONDON ASSESSMENT SESSIONS.

Sessions House, Clerkenwell, E.C.—Friday, Jan. 29.

(*Before Mr.* W. R. M'CONNELL, *Chairman, and a Bench of Magistrates.*

The Assessment of the South Metropolitan Gas-Works.

Sir E. CLARKE, Q.C., M.P., Mr. BALFOUR BROWNE, Q.C., and Mr. W. C. RYDE represented the Company. Mr. R. D. M. LITTLER, Q.C., C.B., Mr. MARSHALL, Q.C., and Mr. HORACE AVORY appeared for the Greenwich Union; Mr. MARSHALL, Q.C., and Mr. GRAHAM, for the parish of Battersea; Mr. MARSHALL, Q.C., Mr. SINCLAIR COX, and Mr. CUTTER, for the Woolwich Union; Mr. LAWSON WALTON, Q.C., and Mr. T. T. PAYNE, for the Lewisham Union; and Mr. GRAHAM and Mr. ELLIOTT, for the parishes of Clapham and Streatham.

In stating the case for the respondents,

Mr. LITTLER said his witnesses held that there were certain items which ought not to be treated in connection with the 17½ per cent. basis; and they had taken a general average of 15 per cent. In view of what the Chairman had just said, it was desirable that his witnesses should have an opportunity of distinguishing between the items on which they allowed 17½ per cent. and those on which they allowed a lower percentage; and he would therefore at present prefer not to furnish their valuations. In opening, he did not propose to do more than discuss certain of the evidence which had been given on general principles, and also the lines on which the case for the respondents would be conducted. There was no doubt that there was the very greatest difficulty in setting up with flesh and bone the dreadful skeleton of the hypothetical tenant. They were bound to find, in the best way they could, what a person would give for this great undertaking—knowing that no single man would ever be found to take the place of the actual tenant. It was quite possible, however, that they might found a Company who would be prepared to hire the premises, and do the tenant's work; simply taking the hereditament from someone who owned it. They had to discover what rent a tenant would pay, who was solvent, who presumably had no other means than those he put into the concern, but who was willing to take the hereditament for a year, with the reasonable prospect of continuance implied in the tenant paying a fair rent to the landlord. The witnesses hitherto had sought to show that the tenant of this property, which was worth from 2½ to 2¾ millions, would get off with a rent of between £80,000 and £90,000; so that he would receive of the total net receipts something like 16s. 4d. in the pound as an allowance for capital embarked. They said, in effect, that no solvent tenant would give more. This was one of the things the Court had to determine. The tenant further, when in possession, was to have a fair and reasonable allowance—no more—for the outlay to which he had gone. It was now established law that the actual tenant must be assumed to be a possible hypothetical tenant; and therefore, in judging what a person would be likely to pay, they were entitled to consider what the person actually in possession would give. Directly, the dividends that had been declared had nothing to do with the question; but indirectly they had, as they tended to indicate what any person carrying on the business would be likely to obtain. The Company were one of the most successful in existence—so successful, in fact, that they had not only been able to declare dividends of 13 per cent., but to tide over a year of signal adversity. This was done by keeping back part of the earnings, though still distributing a very handsome dividend. When the time of adversity came, the Company immediately claimed upon the parishes, and had their rateable value very considerably reduced. When prosperity arrived, therefore, the parishes were entitled to ask that there should be a reasonable increase. His witnesses (those for the Greenwich Union) had taken the proper account year to be 1894; and so far as this Union was concerned, it was certain that that was the right year to take, because Mr. Livesey had said it was true that he went before the Assessment Committee of this Union before the accounts for the succeeding half year were published, and the Committee could therefore only have before them the accounts for the year 1894. When they were considering what was to be done with five years in succession, surely the proper year to take as the account year was the one immediately before the quinquennium. The course taken by the Company, though it might guide the Court to a certain extent, was not one ordinarily followed; and it was open to the very special objection that, if once they considered anything beyond the account year, there would be very great difficulty in knowing where to stop. Notwithstanding the decrease of a penny in the price of gas, the rise in the consumption was marvellous; and the increase in the money receipts more than overtook the decrease which would be due to the lower price of gas. The object of the decrease was to get rid of the surplus, which was so great that they could not appropriate it to any of the accounts. Therefore the undertaking was in a most prosperous state; and this condition was sustained in 1895, despite the diminished price of gas and the reduction that occurred in the price of residuals, by the consequences in another direction of that very diminution in the price of gas. Why was not the Union to share in the prosperity of the Company—and legitimately so—on the true principle of the Act of Elizabeth, which said that every man in the parish was to contribute according to his means? As to the deposits of the workmen, he contended that, though they were withdrawable at very short notice, the Company could still use them, because, even if all were withdrawn, they could obtain a temporary advance from their bankers. Up to the present, the deposits had never gone below £26,000; and why should they go lower in any year? The Company were in the position, in this matter, of any ordinary banker, who, of course, invested the deposits of his customers, but who would very soon suspend payment if all the deposits were demanded at one time. Then as to the theoretical stock of coal. Mr. Livesey admitted that the Company had never had it; and Mr. Marshall said, in effect: "If you had my theoretical stock of coal, you would never have had to pay £7000 for breaking the ice." Yet he charged both these to tenant's capital. Coming to the respondents' valuation, Counsel stated that they had taken the accounts for the year 1894, which would, of course, give different results from those made out by the other side. The receipts were: Sale of gas, £767,387; public lighting and under contracts, £60,391; meter and stove rentals, £32,594. These figures, less £3452 for bad debts, gave £856,920 as the total gross receipts.

The CHAIRMAN asked if, when the valuation of the Company was before the Greenwich Assessment Committee, they did not consider the figures for the first half of 1895, and reduce the whole assessment.

Mr. LITTLER replied that they also had to deal with the residuals. He contended that only the figures for the year 1894 should be considered, and not those for any subsequent period.

Sir E. CLARKE: If the 1894 figures only are taken, then the Company would ask to be entered on the supplemental list, and would pursue an appeal in respect of the changes that have taken place since 1894.

Mr. LITTLER: I certainly contend that, as a basis, we must take the 1894 figures. They not only support this assessment, but give a figure above it.

The CHAIRMAN referred to a case in which his predecessor in office, at the last quinquennial valuation, had taken into consideration figures beyond the actual year immediately preceding. This, however, was not done as a matter of right, but of convenience, as a request to be entered on the supplemental list, if the later figures were not considered, was threatened.

Mr. LITTLER said the subsequent figures could not have been before the Assessment Committee when they made their valuation. The question was: Were the respondents right in what they did before the Committee? The Committee came to a decision on July 31, 1895. If this decision was a correct one, subject to any rights which the appellants might have, it was to guide everybody for the next five years. Was the Committee's decision right on the materials then before them? It was impossible for the Court to import anything, right or wrong, which took place subsequently. On the evidence then before the Committee, and on the only evidence which could then be before them, he held that they had made a proper valuation. They not merely took the 1894 figures, but allowed for what Mr. Livesey, as a practical man, stated with regard to the future; making a considerable reduction on the original figures, and allowing, as they believed, sufficiently for any variations that might occur. The only thing the Court had to consider was whether, on their then information, the assessment made by the Committee was correct.

The CHAIRMAN: Would your argument go as far as this: Supposing evidence had been given on July 30 that 20 per cent. of the consumers had ceased to use gas and had adopted electric light, and that now, at the end of January, it was shown that, instead of 20 per cent., 50 per cent. had adopted electric light, that could not be given in evidence in abatement of the rate?

Mr. LITTLER: Certainly—not on this appeal. On a new appeal on fresh facts, you might consider it.

The CHAIRMAN: Is not this a re-hearing of an appeal which, for the purposes of to-day, may be held to have taken place on July 31?

Mr. LITTLER: Yes; and nothing more. The very objects of the arrangements of this Act were to avoid annual appeals; and therefore it was said that, whatever decision was arrived at by the Assessment Committee without appeal, or by the Court after appeal, should abide for five years. The very fact of there being a supplemental list shows that there was no intention to go beyond the actual year's list.

The CHAIRMAN suggested that the discussion would be better at the close of the case; and that Mr. Littler should therefore go on with his address.

Mr. LITTLER (continuing) said the respondents had taken the actual figures in every case. The gross receipts for the year 1894, as above, were £856,920, which was less than the figures on the other side. The working expenses were: Coal, carriage, &c., £392,379; purification, salaries and wages, £127,101; share of profits of workmen, £12,436—a total of £531,926. In consequence of the evidence given, he should distinctly reduce the amount of the tenant's share. As to the working expenses, the appellants said a five months' proportion should be allowed. His witnesses said four months was sufficient; but they had allowed four and a half. This would make a considerable difference. With regard to the rates, there was not much in dispute. He, on the whole, thought the tenant would have to pay a half-year's rate before recouping himself; and Mr. Marshall's evidence was therefore probably right on this point—except that he took a theoretical figure, instead of the actual. Then the respondents took, as did Mr. Marshall, the whole of the consumers' deposits as a matter which they were entitled to their credit; and the same as regarded the workmen's deposits. From the prime cost of the meters and stoves they deducted one-third for depreciation; believing that they could not be kept in a condition in which a tenant would give more than two-thirds of the value. The tenant's stores, furniture, and tools were taken at an estimate. In short, his valuers made out, on the figures of 1894, that the Company ought to be rated at 21·625 per cent. of the gross receipts; whereas the Company contended that they should be rated at from 9 to 10 per cent. on the year 1895. The result of this would be that, so far from the rate made being excessive, it was considerably below what might be supported by the income of 1894. The witnesses to be called varied a little; but, roundly, they made the rateable value of the whole undertaking £260,000, and that of the productive mains between £185,000 and £190,000. With regard to the figures of tenant's capital presented by the other side, Counsel pointed out the difference there was in the amounts; Mr. Ryde's being £675,000, Mr. Woodall's £745,000, and Mr. Marshall's £730,000. He also alluded to various discrepancies in the calculations of these gentlemen; asserting that they were only agreed that they must allow the 17½ per cent. on the tenant's capital. His witnesses put the tenant's capital at £490,000; but included in this were items—stores, &c.—which they considered were not properly to be charged with the 17½ per cent. They had taken the average percentage at 15; but now they would have to separate the items on which they considered the 17½ per cent. should be charged, from those on which smaller percentages should be taken.

Mr. *Thomas Dinwiddy*, called and examined by Mr. LITTLER, stated that he had had large experience in valuing gas undertakings. He was present when Mr. Ryde and Mr. Livesey were before the Greenwich Assessment Committee in July. At that time, they had no definite accounts of the year 1895. They had Mr. Livesey's general statement and predictions of anticipated losses but no figures that the Committee

could deal with for rating purposes. Before Mr. Livesey went before the Committee, the proposed figure for the rateable value of the Company's property in the Greenwich Union stood at £8794, and the gross at £10,553. Witness acted for the Overseers; and these figures were based on his valuation. The Company claimed a reduction to £5321; and the Committee, as a matter of fact, abated the sum to £7639. At the time the assessments had to be determined, the only figures available to the Overseers' advisers who had to initiate the rate were those for the year preceding the quinquennial period—in this case, 1894. By the time the lists were issued, the Companies, generally, would have knowledge of the figures for the succeeding year. If they were favourable to themselves, they would produce them; if not, they would suppress them. When the South Metropolitan case was before the Committee, figures were given showing an alleged reduction in the value of residuals; but nothing was produced to indicate the rosy side of the succeeding half year. Witness, in his valuation, found that the Company's receipts, less bad debts, for the year 1894 were £856,920. In regard to the working expenses, he had taken the actual amount from the Company's books. He included "share of profits to workmen" in this item, though not in another case, because he regarded it as a proper expense, and as being a sort of enhancement of wages. As to the residual products, he had also taken the actual amounts from the books of the Company. His figure for the working expenses, less the sale of residual products, was £190,214. The item of "gas-fitting (labour)," which stood at £5092, he had halved, because it was a new item, and without explanation he thought it not right to charge the whole for one year. He had no knowledge that it would be a recurring charge; and from what he had since heard, it appeared a doubtful item, as it arose altogether in connection with the automatic meters, and was covered by the extra cost per 1000 cubic feet charged for gas consumed by these meters. Therefore, strictly speaking, nothing should be allowed for this. Under the head of management he had put the whole of the Directors' fees; but he was not surprised to hear one of the appellants' witnesses say it was proper to give one-half for the landlord's and the other half for the tenant's interest. Strictly, he thought, they should go to reduce the tenant's interest; and in allowing the whole £3500, therefore, he had dealt liberally with the Company. In law charges, £4906, he had allowed £1300 more than the average over five years.

Mr. LITTLER: Repairs of tenant's chattels, machinery, and plant, not included in the rateable hereditament, £35,000. How do you arrive at that?

Witness: By a division of the total outlay reported in the balance-sheet for the year for repairs (£108,939), attributing one-third of that—roundly, £35,000—as it was not possible to get at an exact proportion. In the year 1890, the outlay on repairs of works and plant was £91,098; and this, on 637,583 tons of coal carbonized, gave an average of 2s. 10·2d. In 1892, the percentage was 2s. 6·4d.; in 1892, 2s. 7·8d.; in 1893, 3s. 0·7d.; and in 1894, 3s. 7·8d.—the average over the whole five years being 2s. 11·4d. This average, applied to the 738,592 tons of coal carbonized in 1894, gave £108,000—the figure he had taken. It was inconceivable that a thriving Company, with a monopoly, and with a sliding-scale to defend their figures, could starve works for three years, and yet keep them in a proper state of efficiency.

More especially when they were dividing 13 per cent.?—It is inconceivable; and I am certain that, under such admirable management as Mr. Livesey's it could never happen. The gas-works are kept in an excellent condition.

Friday, Feb. 5.

On the resumption of the proceedings this morning,

Mr. *Dinwiddy*, recalled and further examined by Mr. LITTLER, stated that he had amended his valuation in accordance with the views of the Court, as to allowing the 17½ per cent. on the tenant's capital.

The CHAIRMAN: This account does not cover any part of 1895?

Witness: No.

Mr. LITTLER: We show you the account must be for the year 1894.

The CHAIRMAN: It is of importance to determine soon which year you will take, because the figures on one side are given for half the year 1894 and half of 1895, and on the other for the whole of 1894. We shall have difficulty in comparing the figures when we come to sift them.

Mr. LITTLER submitted that only the accounts for the complete year, 1894, could be taken. He quoted Mr. Justice Blackburn's decision in the case of the Abney Park Cemetery, where it was laid down that no injustice would be done if the Company were rated in every year with a value which the hypothetical tenant would give in the preceding year. The object of the statute, Counsel held, was first to secure uniformity of rating; and then that this uniformity should be secured for five years. He quoted another judgment to show further that the value of property for the purpose of rating must be estimated at the time the rate was made. Every person put in the quinquennial list for 1894, and who did not appeal, was treated on this principle. But in this case it was contended that, because it happened that the appeal was of necessity later than the time prescribed by the Act, the Court was to accept as evidence circumstances which did not affect anybody else's property for that year. If a decrease or increase in value worked hardship, the Assessment Committee were entitled to put the property on a supplemental list in respect of any increase; while the owner was entitled to apply to be placed on this list should a decrease have occurred. All the other ratepayers having been dealt with on the 1894 basis, this Company ought to be treated in the same way. If this worked hardship, the Company should have given notice that they required an amendment of their rating, according to the receipts of 1895. It was sound law, he ventured to say, that, where there was no consent to take other figures, the Court was bound to consider only the facts known at the beginning of 1895. This being so, his clients had acted on the only principle on which they could present the valuation, for the Company came before the Committee before the receipts for the first half of 1895 were known.

The CHAIRMAN said there was some evidence before the Assessment Committee, when they made this assessment, of the fall in the price of residuals.

Mr. LITTLER agreed that it was so; but he contended that this could not affect the rate, because it was based on the 1894 figures, and not on what the Company would get in 1895. The Committee, too, discussed the matter much later than they ought to have done. The principle of taking the figures for the whole year preceding the year of making the assessment, had been followed in every case that had come before the Court except that of The Gaslight and Coke Company. In that instance, the circumstances were very special. An application was made to the Court on the point; and it was agreed on both sides that subsequent figures should be taken. In the present case, no such agreement had been made, or ought to be made, in the interests of the ratepayers generally.

Mr. MARSHALL supported the arguments advanced by Mr. Littler. According to section 42 of the Valuation Act of 1869, the Overseers were to make and deposit a valuation list with the Assessment Committee before the 1st of June; and the Committee, before the 1st of October of the same year, were to hold meetings, if objection were made, to revise the list. They were therefore an appellant tribunal from the Overseers; so that, if the argument was good that new evidence might be laid before them up to the end of their sitting on Oct. 1, the argument would be equally good that evidence might be laid before the present Court up to the last sittings there. Therefore, there was no reason why the Court should not have figures before them, not only for 1894 and part of 1895, but for the latter part of 1895 and 1896 also. The result would be absolute confusion and injustice, and would make it impossible to arrive at any satisfactory conclusion. He submitted that the list was made by the Overseers alone; the Overseers only had the figures for 1894; the Committee were only an appellant tribunal from them, having merely the figures the Overseers had; that, in the same way, the present Court could only deal with the same figures. The evidence laid before the Assessment Committee amounted to no more than was now before the Court. The balance-sheet for the first half of 1895 was not printed; and the only indication they had as to the future income was a statement by Mr. Livesey or the Secretary of the Company, with regard to an expected fall in the price of residuals, and a sort of augury as to what the effect would be on the gross profits—which augury had not been fulfilled. If the 1894 accounts alone were taken, both sides would be in possession of the whole material; and neither would have any advantage.

Sir E. CLARKE said, if it should be held that the Court was bound to take only the figures for 1894, then he thought it would follow, as a matter of course, that his clients should be entitled to ask for a supplemental list, in respect of any change that might have taken place since 1895. The decision on this point would certainly save a great deal of time, not only in the present case, but in future appeals, for it was a question which had been raised several times, and, he believed, decided, though not in terms. Counsel stated what was the procedure of the Overseers and Assessment Committee in preparing the valuation lists, and went on to assert that it was for the Committee to decide, not whether the Overseers when they made their valuation were right, but what was the value of the hereditament at the time they (the Committee) were fixing its value for the list. No one would deny that, if the Assessment Committee met on Oct. 1, they would have to alter the value of a property, if they found that the figure put on it at that time was wrong. In July, accounts to the middle of 1895 were published; and therefore at the time the Committee finally settled its list and sent it forward in November, the accounts had been published some months.

Mr. LITTLER: It is distinctly proved that we finished the whole thing before July 31; and the accounts were not published till August.

Sir E. CLARKE said his contention was that, by the Act, the Committee had to revise up to October; and that there were therefore several months during which they could have revised with the 1895 accounts before them. There was one section of the Act which put the matter, he held, beyond dispute. The Court might have to deal with a case where there was no approved valuation list. In this event, under section 36, the Justices in Assessment Sessions might appoint some person to make a valuation. Supposing, in the present case, the Court were to appoint a valuer under that section, how would he value the hereditament? As at the end of 1894, or as at the value it had now? It was unarguable, of course. He would have to value it as it was now, whatever the materials he took to arrive at the valuation. The present Court had to revise the valuation list, and ultimately to decide what was the true value of the hereditament. This had been decided, if not in terms, at all events inferentially. In the case of The Gaslight and Coke Company and the City of London Union, which was quoted at length by Counsel, Mr. Littler (for the Company) gave statistics of receipts and expenditure for a period subsequent to the year ending June, 1890—which was throughout called the account year, and to which, in the present appeal, the year ending June, 1895, would correspond. The Chairman on that occasion said, if the calculations were based on the accounts for the year ending June, 1890, he did not think the Court could consider the later figures, except in so far as they showed an ascending or descending scale. The witnesses in that case all calculated on the figures for the year ending June, 1890.

The CHAIRMAN: You do not contend for more than that?

Sir E. CLARKE: Not for more than that; but I contend for this as a proposition of law, on which the Court, I hope, will give a definite judgment—that the accounts of the year ending June, 1895, having been published at a period two or three months before the duties of the Assessment Committee expired in October, they were facts which we were entitled to have as the basis of the rating for the five years. Counsel referred also to another case—that of The Gaslight and Coke Company and the Hackney Union—which, he held, not only recognized the judgment in the other case, but emphasized it, and established the doctrine that the year which had expired, and the accounts of which had been published before the Assessment Committee gave their decision, was the year of which they were entitled to take the figures; also that they were entitled to give any facts tending to show the value of the property up to the time the Court came to a decision. What the Court had to consider was what a hypothetical tenant would give for the property. Such a tenant must be assumed to have a hypothetical knowledge of the property and all the circumstances connected with it; and if there were proved to the Court, as a fact, something which did affect the real value of the property, then the hypothetical tenant must be supposed to know of it.

A decision on the point would save a great deal of time, because at present the Court was dealing with incommensurable figures. Should the Court decide to stand by the decision in The Gaslight and Coke Company's case, and take the year June, 1894, to June, 1895, the other side would have to amend their figures; and then, when two sets of figures for one year were furnished, there would be much less occupation of the time of the Court.

Mr. BALFOUR BROWNE, who followed on the same side, said the Court had not to find what rent would have been paid for this property, but the rent that might reasonably have been expected. He thought the respondents were placing too much reliance on the evidence of the whole year, which, while good, was not conclusive. They must, in addition to that, see what the next year's revenue would probably be; and the Assessment Committee certainly had the fact before them that the price of gas was to be lowered.

Mr. LITTLER, in reply to the Chairman, said the Court might take into account the difference in the price of residuals as a fact, but not with regard to figures.

The CHAIRMAN: Would the accounts of the half year showing a reduction in the price of gas be evidence?

Mr. LITTLER: No; I say they are not bound to lower the price of gas. If there were a statutory obligation on them to do it, I should admit it.

The CHAIRMAN: On the representation of Mr. Livesey before the Assessment Committee, the Committee did reduce the figures by a certain amount. Is that admitted?

Mr. LITTLER: They undoubtedly did.

The CHAIRMAN: Mr. Livesey's position, here to-day, is that they did not reduce them sufficiently.

Mr. LITTLER rejoined that the position of the Committee was that, if they had known the facts, they would never have reduced the assessment at all. After referring to the case of the Street Tramways Company, in which the Court decided that the accounts for the year ending Dec. 31, 1885, were the proper basis for rating in the following quinquennium, he proceeded to state that, if the Committee had wrongly admitted evidence, that was no reason why the Court should do so. He also reminded the Court that the Committee tried to administer rough-and-ready justice, hearing everything that could be said on both sides. What possible anchor could the Court have, unless they took as the basis the year which the Overseers took when making their rate? As to sections 36 and 37 of the Act, to which the other side had referred, he (the learned Counsel) said the valuer was simply appointed by the Court to do what the Court otherwise would do—to report on the issue before them—and the Court then exercised full discretion as to acting on it. The question for the Court to consider was: What was the value of this hereditament at the time the Overseers first took the matter in hand? Nothing else could be considered, save, perhaps, general evidence to show that this was a particular year—such as that residuals had fallen—but certainly not such evidence as a reduction in the price of gas, which was one of the Company's own acts. The evidence the Company were offering was good on being entered on a supplemental list, but not here.

The CHAIRMAN: If your objection is held to be good, would you contend that the Company were out of time to be entered on the supplemental list?

Mr. LITTLER: I cannot tell you what the Committee would do.

The CHAIRMAN: Then you are arguing a remedy which you might exclude them from exercising. I think you ought to say what you would do in case we held your contention to be right.

Mr. LITTLER said the proper thing, for precaution's sake, for the Company would have been to have deposited an application to be entered on the supplemental list. Notwithstanding this, they had not done it. He was now told the Committee would waive any objection as to being out of time—that was, of course, on the understanding that the 1895 accounts were not considered. If this were done, it should be fairly ascertained, in the ordinary way, whether the Company were entitled to the relief they sought, just as if this appeal had not been brought.

The CHAIRMAN: To prevent their resorting to a supplemental list and the re-hearing of the case, do you not think a basis might be arrived at for disposing of the whole case now?

Mr. LITTLER: That would require consideration; but as far as my clients are concerned, they want no more litigation. Once the principle is settled on the 1894 accounts, the alteration which would take place on those for the year 1895 would probably be only a mere matter of arithmetic.

The CHAIRMAN said the suggestion was merely thrown out to save trouble, expense, and litigation. The Court did not shrink from deciding the point; but if it were decided now, it might possibly lead to other litigation.

Sir E. CLARKE said he had to ask that the figures to June, 1895, should be considered. The Court so decided in the Tramway Company's case, where the question was definitely asked and answered.

Mr. LITTLER said, if the Tramway Company's decision was to take effect in all cases, he had no hesitation in saying it was absolutely wrong. He distinguished that case from the present.

After further argument,

Mr. GRAHAM stated that his clients desired that the point in dispute should be decided one way or the other; and, if necessary, that it should go to a Superior Court.

Sir E. CLARKE suggested that it would be convenient for all concerned if the Court would consider in private, and give their decision on an appointed day, when a further day for the continuance of the hearing could be fixed.

Mr. LITTLER agreed in this view, expressing a hope that, as soon as the decision was given, the party adversely affected would take the point as quickly as possible to a Superior Court.

The CHAIRMAN agreed to the suggestion, and fixed the 13th inst. as the date for giving the decision of the Court on the point.

The Water Supply of Bewdley.—The Bewdley Town Council have adopted a water-supply scheme prepared by Mr. R. E. W. Berrington, of Wolverhampton. The estimated cost is £3738.

MISCELLANEOUS NEWS.

THE GASLIGHT AND COKE COMPANY.

The Ordinary Half-Yearly General Meeting of this Company was held at the Chief Office, Horseferry Road, last Friday—Colonel W. T. MAKINS, the Governor, in the chair.

The SECRETARY and GENERAL MANAGER (Mr. John W. Field) read the notice calling the meeting; and the report of the Directors, with the accounts for the six months ending Dec. 31, 1896, given in the "JOURNAL" last week, was taken as read.

The GOVERNOR, in moving the adoption of the report and accounts, observed that, after a long period of almost stagnation in the sale of gas—a condition which, as shown in the published accounts, had also been the experience of the other Metropolitan Companies and of gas companies in general—it was most satisfactory to find that a material and maintained improvement had taken place in the Company's business. It was also reassuring to find that this improvement was not limited to any one class of the Company's consumers. The sale of gas for street lighting had increased, and that for private consumption—especially for heating and cooking purposes—also; while the number of consumers by automatic meter was increasing regularly week by week. The sales of gas in 1896 exceeded those of 1894—the year prior to the full introduction of the slot meter system—by 1874 millions, or an annual average of 5 per cent. for the two years; and the meeting would probably be pleased to learn in what proportions the several classes of consumers had taken this extra quantity of gas. With respect to public lights, of the 874 million cubic feet of gas, 24 millions, or 1·28 per cent. of the whole increase, had been taken; their private consumers had taken 1083 millions, or 57 77 per cent.; and the automatic meter consumers had taken 767 millions, or 40·95 per cent. One of the chief characteristics of the increase of the past half year had been its regularity month by month. It had not been by spurts, as was sometimes the case; but the regular consumption had increased monthly, and the demand had not been abnormal, limited to a few days. They had also to take into consideration that the weather, though wet and dull since the close of autumn, had not been marked by any appreciable amount of either frost or fog; and inasmuch as the quantity of gas sent out from Jan. 1 to the 3rd inst. showed an increase of 10·7 per cent. over the figures for the corresponding 34 days of 1896, they thought they might consider that the increase in their business in the past half year would in all probability be maintained, if not exceeded, in the present half year. The chief sources of increase would be fully clearly shown if he mentioned one or two more figures. He would give the meeting as few figures as possible; but it was necessary, in elucidating the working of the Company, to trouble the proprietors with more figures than was customary in other companies. The number of gas-stoves in their district—those sold by the Company, and those let on hire for heating and cooking, but exclusive of automatic consumers' stoves—had increased from 59,136 in 1894 to 82,691 in 1896, or an increase of 23,555, which was equal to 39 8 per cent. Adding, however, automatic consumers' stoves, the total increase in the number had been 66,327, or 112 per cent. in the two years. With reference to the automatic meters, he might state that the average annual consumption of this class of their customers was from 19,000 to 20,000 cubic feet, which was a great deal more than they ever expected when they introduced the system; and it was very satisfactory to find that the number of these customers had been, both in 1895 and 1896, and was now also, regularly increasing at the average rate of between 400 and 500 stoves a week. There was one drawback, and only one, to the system of automatic meters, and this was, unfortunately, that their legal expenses had had to be slightly increased this year in consequence of the law costs incurred in dealing with robberies of coin from the meter-boxes, and in the recovery of disputed accounts. He hoped this expenditure was not to be considered as a permanent charge on the revenue from these customers. He believed that it was incidental to the first introduction of the thing, and that as the use of automatic meters became general, they would, as in the case of other matters and other automatic collecting machines, be considered more sacred by the pilferer and the area sneak. With reference to the question of residuals, owing partly to the mildness of the latter months of the past year, and partly to the competition of coke sent from the Provinces to London—and also, as he believed he mentioned last year, to the increasing use of gas for heating purposes—the market for coke had necessarily not been so good as it was. In fact, he might say that it was in an unsatisfactory condition. But he was glad to be able to report that for their export sales they had been able to secure materially better prices for their Beckton coke than for the sales for home consumption; and as they had shipped about 66,000 tons during the past half year, as compared with 11,000 tons in the corresponding months of 1894, and they had to ship a further 100,000 tons during the present contract season, they had now under consideration plans for so dealing with this important development of the Company's coke trade as to encourage still larger dealings with their foreign buyers. They had adopted this course not with the view of unduly enhancing the price of coke for home consumption, but simply to secure a more level line of prices for coke over the whole year, and year by year. There was another point in connection with the coke question to which he desired to call attention. On referring to statements Nos. 10 and 12 in the accounts, they would see that there had been a very large make of oil gas during the past six months. It showed an increase of 75 per cent. on the make in the corresponding period of 1895. One of the great advantages of this system at a time like the present was that not only was no coke produced by them, but a large quantity was used for the process. The quantity of coke thus taken off the market during the past six months had been 26,500 tons. With regard to tar products, the market was not quite so good as in the past two half years. Still, it continued satisfactory; and, at any rate, the net yield per gallon of tar to the Company amounted to 1·6d. This figure they thought would probably be maintained. As regarded sulphate of ammonia,

this residual had found a very dull market; and the yield of revenue per ton of coal was again lower. The feeling had been slightly better in the past two months; and business had been done at rather higher prices. The quantity sold by the Company during the past half year for prompt or forward delivery had been more than twice as much as in either of the corresponding half years, both of 1894 and 1895; and therefore they had not very much to complain of as regarded sales, though the price was a different thing. It was, however, too early in the year to assume anything with respect to the improvement in this residual. They hoped—though it was impossible to say whether or not it would be so—that the worst had been passed, and that sulphate would become a more valuable residual product to them. As regarded the whole question of residuals, it was some satisfaction to find that the accounts of gas companies generally showed the same features as their own; and they could console themselves with the reflection that, allowing for differing conditions, they had done as well as anyone else. He was sorry to have to refer to one matter in regard to their residuals which he thought was much to be deplored. In the early autumn of last year, statements were made officially by the Chairmen of two other Gas Companies in connection with this Company's coke sales. He thought it would occur to most men that the place in which to criticize the accounts of this Company was that room; and if the management of the Company was to be attacked, the attack should be delivered there, where alone it could be met and dealt with. The statements made on the occasions in question were all more or less inaccurate and misleading. But two of them were without foundation; and the criticisms were couched in language which he thought would, on reflection, be regretted by the gentlemen who used such language. Of course, they took no notice of the opinions of others, for everyone could hold his own opinions. But he thought that, before statements were made which affected their Company and other companies, care should be taken to verify their accuracy. It was said first that this Company could have sold coke to their contractors in September, 1895, for 10s. a ton. The truth was that on the 8th of October of that year they offered to sell coke at that price, and the contractors in question absolutely declined to pay it. The second statement was that at the date of the speech, they were "selling a large quantity of coke at as low as 8s. a ton." The truth was that out of the 595,000 tons of coke sold by the Company for the nine months ended Sept. 30, 1895, 14,104 tons only were sold at so low a price as 8s. Of this 14,104 tons, 13,772 tons were sold in January, February, and March; and not a single ton of coke was sold at Beckton during the whole nine months in question below 9s. per ton. He would have them observe that these statements were publicly made, just at the time of year when it was well known they were about to advertise for tenders for coke; and he thought there could be no doubt that buyers were induced to offer lower prices, and that this had contributed to the low price at which their coke, and that of other companies, had been selling during the closing months of the past year. Gentlemen who made these statements on their own responsibility shut their eyes to the fact that, in damaging this Company, they did equal damage to their own undertakings. He never answered attacks except from the chair, and he only had to apologize for taking up their time—(No, no)—in explaining what he thought it was necessary to explain. The facilities for obtaining information direct from the office were great; and they never refused information at all. If there was any shareholder or consumer who desired information, there was no excuse whatever for him to publish misleading or inaccurate information, because by going there the information could be verified before it was published. The value of this action was apparent, because a gentleman holding a very important and responsible position in regard to the dissemination of intelligence on gas matters was lately saved from appearing publicly in a most ridiculous position by submitting his information to the Company before sending it to the public. Turning to the expenditure side of the accounts, the figures would be found to be satisfactory throughout. Coals—which included enrichment and all charges for carriage—had cost 10s. 11¼d. per ton, or 2¼d. per ton less than in December, 1895, and less by 1d. than in June, 1896, when he told them that they reached the lowest price on record. No doubt a considerable part of this saving was through their having adopted labour-saving machinery—the cost of handling coal having been materially diminished in this way. Their wages also showed a satisfactory reduction per ton of coal carbonized; but what was still more gratifying to note in this connection was that the men in the Company's employ evidently appreciated the conditions of the Company's service. Good wages, shortened hours of labour, and every possible consideration from the Company in time of sickness, old age, or other infirmity were bearing good fruit; and he would like, in the name of their workmen, to thank an anonymous benefactor who lately secured for the use of their men, their wives, and their children, an abundant supply of admission orders to the Metropolitan Convalescent Institution. The benefits of this most valuable Institution were greatly appreciated by their men; and the liberality of their anonymous friend would prove a real boon to them. He also desired to express the cordial thanks of his colleagues and himself for the kind thoughtfulness which had been evinced by this munificent donation. With regard to the subject of purification, the figures were rather more satisfactory; but for the whole year they did not show that advantage which they had anticipated from the adoption of the "Weldon Mud" process. The considerable and unlooked-for reduction in the amount allowed by the contractors for the residuum from the process had (to use a homely phrase) "taken a good deal of the gilt off the ginger-bread." Wear and tear charges were, with one exception, normal; and they represented the cost of the maintenance of the whole of the Company's plant, buildings, and machinery in a state of thorough efficiency. The exception was an item of £8000, which was one-half the cost of plant and machinery demolished at the Westminster station in order to make room for an extension of office accommodation, which had become absolutely necessary in consequence of the rapid growth of the Company's business. It might be well to inform the meeting that during the past ten years they had applied £60,000 to wear and tear account, in direct reduction of capital, which otherwise would have formed part of their divisible revenue. This was a charge which they were not compelled to make; and, as far as he knew, it was peculiar to their Company. But it was agreed to by the Directors in deference to the wish expressed by the late Mr. Parkes, the first Official Auditor, that some attempt should be made—although there was no parliamentary obligation in the matter—to reduce by some such appropriation the amount of the capital rendered unproductive upon the demolition of their City and other works. But for this particular item of £60,000, the amount that they carried forward would have been over £105,000, instead of £45,700. When they came to the expenditure on distribution account, their figures—although less than in December, 1895—showed a large increase when compared with former years; the charges amounting to no less than 23 per cent. more than in the December half of 1894. Of course, on the face of it, this appeared to be rather a serious matter; but when they compared the number of ordinary consumers, of automatic consumers, and of stoves at that earlier date with the corresponding figures for December last, the explanation, he thought they would say, was at once complete. He had told them, as regarded stoves, that there had been in the two years an increase of over 112 per cent.; and he would now give the figures of the consumers. On Dec. 31, 1894, the number of ordinary consumers was 218,035; and on Dec. 31 last, the number was 225,403. This was an increase of 3·4 per cent. for the two years—about the normal rate. On Dec. 31, 1894, the number of automatic meter consumers was 1361; whereas on Dec. 31 last the number was 52,681—a total average increase in the number of consumers who required the daily attention of the rental and distributing staff of 26·7 per cent. They would, therefore, see that the increase in their distribution expenditure was more than fully accounted for, and very satisfactorily accounted for. With regard to automatic fittings, whereas in the case of some companies the rent charged for the use of these fittings was deducted from their distribution charges, this Company dealt with the item by way of deduction from the first cost of the installation. The amount they had appropriated on this head for the past half year was £12,643. Of course, he need not state that their rates had gone up as usual; and they showed an increase this time of £10,000, which was chiefly the result of the revaluation of the Company's undertaking for purposes of assessment for local rates. Law charges, he regretted to state, were considerably higher than in December, 1895; but this increase had been incurred almost entirely in connection with their automatic customers. Bad debts were again materially lower; being no less than £1448 below the figures in December, 1895. But their annuities showed an increase of £1378, of which £1250 was attributable to the operation of the Company's old-age pension scheme, which he believed he explained six months ago, and which the proprietors heartily endorsed. With regard to the undivided balance, they would have been glad if their draft on it had been still less; but it must not be forgotten that this undivided balance was the accumulation of excess profit over maximum dividends in past years, and that the amounts which had been withdrawn from it during the past two years had only gone back into the pockets of the consumers of gas—first, to the extent of £126,000, which they had saved by the abolition of meter-rents, and, secondly, in the way of maintaining the price of gas at a level which, but for this "buffer" fund, would certainly ere this have been raised. He had been asked by a shareholder where in the Company's balance-sheet did the undivided balance of £45,747 appear. The answer was that this balance, as in the case of railway or trading companies, formed part of the Company's trading capital, and was a floating capital in excess of the balance shown in the capital account. (The balance at the credit of capital account was shown at £896,857.) This was not the case with either the reserve or the insurance fund. The amounts standing to the credit of both these funds was represented in the balance-sheet by a corresponding amount of Consols. The amount of undivided balance—this floating capital—answered a double purpose. First, it was capital used in the business of the Company on which they paid no interest or dividend; and, secondly, it tended to the maintenance of the price of gas at a uniform level, without the constant trouble of putting it up or down, in accordance with the exigencies of the price of coal or the sale of gas. He believed that it was a very common practice in all trading companies to have a certain amount of undivided balance which they could draw upon or add to, as the case might be, and which account was a kind of governor of, or safety-valve to, the finances of the Company. Turning to the capital account, he might give them a few more figures showing what had been done during the past few years, more especially in the reduction of the amount of capital per ton of coal. At Dec. 31, 1894, the expenditure on capital account per ton of coal stood at £6 7s. 1cd.; at Dec. 31, 1895, the expenditure went down to £6 0s. 6d.; and on Dec. 31 last, it was £6 3s. 2d., or 4s. 8d. less than it was two years ago, in spite of the amount of capital raised in the meantime. Although the figure in 1896 was higher than the record one of £5 12s. 11d. in 1891, the expenditure required for the automatic supplies satisfactorily accounted for the increase; and they would find that a similar state of things existed in the case of other Metropolitan Companies. The charge for capital for dividend and interest, per 1000 cubic feet of gas sold, for the year 1896 was, notwithstanding the increased amount of capital per ton, less than in 1895 by one-third of a penny. The amount expended on capital account during the past half year had been £117,371, the details of which he gave—the principal expenditure having been on mains and service-pipes, £25,600; on meters, £44,800; and on stoves, £29,000. They would notice the very large proportion of the half-year's capital expenditure which distribution had to account for. He had, however, shown them that over 40 per cent. of their increased business was the result of this special expenditure during the past two years. He might give them a few figures showing the proportions of capital expenditure on manufacturing plant, ordinary distribution plant, and automatic supplies plant. In 1894, the manufacturing charges accounted for 90 per cent. of the total capital expenditure; in 1895, for 30 per cent.; and in 1896, for 22 per cent.—showing a continual decrease. As regarded distribution, the capital expenditure in 1894 was 6 per cent.; in 1895 11 per cent.; and in 1896, 32 per cent.—showing a continual increase. With regard to automatic supplies, in 1894 the capital expenditure was 4 per cent.; in 1895, it was 59 per cent.; and in 1896, it was 46 per cent. He had now completed what he had to say relative to the working of

the Company and the accounts; but they would probably expect him to say something further on a subject which he mentioned at their last half-yearly meeting—he referred to their proposal to consolidate their stocks. The matter had been under the consideration of the Court since; and as regarded those stocks whose dividends were subject to the sliding-scale clauses, the scheme presented no difficulties whatever, and the Company's Solicitor was drafting a measure with respect to these stocks. As regarded the preference stocks, however, they had been met at the outset by objections, which were perfectly legitimate, and which were based upon the order of priority of the preference stocks *inter se*. There might, therefore, be a possible claim on behalf of the holders of the earlier preferences to be dealt with in an exceptional manner, with a view to the saving of their respective rights; and up to the present they had not been able to solve the problem. He hoped it was not insoluble. The attention of the Court would be directed to this point, and any suggestion which could be given to them from outside they would be glad of. He had noticed during the last few days that there had been a feeling of foreboding with regard to the financial position of the Company; and it had been assisted no doubt by the ominous and mysterious comments in some of the evening papers. He thought, to quote a high authority, that this was a very "dyspeptic" view to take of the future of their undertaking. He was not, he believed, an unduly sanguine man, and he had certainly never prophesied smooth things when difficulties were imminent; but he did not in the least share the apprehensions of those to whom he had referred, and he trusted that no timid shareholders (and he particularly addressed the ladies) would be induced to part with their stock at depressed prices in consequence of these rumours. When estimating the probabilities of the future, they naturally looked to the history of the past; and he could not help thinking that the perception of the great vitality and recuperative power of their undertaking must have been somewhat blunted, and that shareholders had forgotten the financial history of the past twenty years. He would therefore recall it. From the year 1876 down to the close of 1888, the reserve fund and the undivided balance of the Company rose almost regularly year by year, until they amounted in the aggregate to £807,000. Within three years (by the end of 1891), the amount of the reserve fund and undivided balance had been reduced to £115,000—that was to say, the whole of the undivided balance of £305,000 and £387,000 of the reserve fund, together £692,000, had been appropriated towards meeting the loss of revenue by the reduction in the price of gas, which also meant increased dividends. In the year 1891, the lowest point was reached; and within three years of that date—December, 1894—they had again accumulated an undivided balance of £255,000; at the same time raising their reserve fund by £10,000. Now, within two years, up to Dec. 31 last, their undivided balance had been again reduced to £46,000, the reserve fund now standing at £132,000; making together £178,000 as the amount they still had in hand of divisible surplus. These fluctuations were not peculiar to the Company—they were common to all the Metropolitan Companies; and if the proprietors compared the accounts, it was perfectly marvellous how they had gone on raising and lowering their available surpluses from time to time in accordance with the policy of reducing the price of gas or in consequence of rises in the price of coal or of other matters affecting the working of the Company. During the last ten years of the period, he might add, the consumers in the Company's district had benefited to the same extent as those in the other Metropolitan gas districts in the way of reducing the charges for gas, and in this Company's case, of meter-rent. He did not say that they would have the same experience in the next three years, because he did not wish to prophesy. But he thought they would agree with him that history had a habit of repeating itself; and he believed that, looking to the rapidly-growing increase of their business to which he had referred, they might look forward, in spite of certain ominous comments from outside, to the future of the Company—again quoting a high authority—with chastened exuberance.

The Deputy-Governor (Mr. Howard Charles Ward), in seconding the motion, remarked that the accounts of the Brentford Gas Company, of which he was Chairman, emphasized some of the remarks of the Chairman as to the difference in the fall in the value of residual products. In the case of that Company, they carbonized 74,000 tons of coal in the past half year, compared with 66,000 tons in the corresponding period of 1895; but they only received about £100 more for coke. Residual products altogether were scarcely equal to what they were last year, which only bore out again what the Governor had said—that gas companies generally had been suffering by the diminished value of residual products. But for this, the £46,000 carried forward by The Gaslight and Coke Company would have been materially increased.

Mr. Rokeby Price, referring to the question of the consolidation of the Company's stocks, said his opinion was that there would be an all-round advantage to every holder of the preference stocks by the amalgamation. This had been carried out over and over again by the Railway Companies. By amalgamating the stocks, they got one large stock, which it was much easier to deal with; and a seller would obtain a better price, because of his stock being a more marketable commodity. He would not, however, make the amalgamation compulsory, but optional. He also suggested that the stock should be lightened or divided in some way, as had been done in many cases—the Peninsular and Oriental Company, for instance—by which one's holding was spread, and a different class of investors came in. He thought that the proprietors generally were much indebted to the Governor for the speeches which he made to them every half year, which were clear and unmistakable, and gave a complete refutation of any charges which were made against the Board.

Mr. George Livesey remarked that at their last meeting, Mr. Rokeby Price, in comparing him to the Prophet Jeremiah, had paid him a very high compliment, although it was meant the other way. (No, no.) The only way he could assume it as a compliment, was that Jeremiah was right; and if the unfortunate Israelites had listened to the Prophet, they would not have met with the misfortunes they did. In like manner, if this Company had attended to him (the speaker), they would have had better prices for their coke, and there would have been a better state of feeling with their contractors. The Governor had referred to statements made with regard to coke by two Chairmen of Gas Companies—Sir Frederick Mappin and himself. Sir Frederick Mappin, at the Sheffield Company's meeting last August, and he himself at the Crystal Palace District Company's meeting about the same time, both felt injured by the low price of products, which they believed was partly due to this Company's blundering. Sir Frederick Mappin and himself did not stand alone. If the Governor met with gas managers, as he himself did, he would know that this was a universal complaint. When the name of the Chartered Company was mentioned, they said that it was the curse of the products trade, both as to ammonia and coke. This was rather a strong statement; and he felt bound to justify it. In 1894, one of the largest cement makers came and offered an extraordinary price (12s. 6d. per ton) for coke; but the Chartered Company thought they would do better, and forced the price up to 13s. 6d. a ton—an outrageous figure, which the cement makers had to pay. In 1895, they were determined that they would give nothing like that price; and by forcing them up to 13s. 6d. a ton, the Chartered Company forced them into combination. In 1895, instead of pursuing their usual policy, and negotiating in a friendly way with these gentlemen, as had been done successfully for many years, the Chartered Company determined to adopt a new policy with respect to cement makers' contracts, and asked for tenders. These gentlemen told him (the speaker) that they would have given the Company 10s. a ton at that time, the same as they paid to the South Metropolitan Company; but when the Chartered Company asked for tenders, they all offered 9s. 6d. a ton, which was refused. This was about September or October, 1895. They all stood out; and the Company stood out. The result was that the latter accumulated an enormous quantity of coke by the end of the year, which by January or February had further increased to 200,000 tons; and the cement makers were still standing out. At the Chartered meeting last year, Mr. White, Chairman of the Cement Makers' Association, said to him in that room that they had offered 9s. 9d. a ton; but the Company wanted 10s., and 9s. 9d. was refused. Shortly afterwards, however, they were forced to take a price below 9s. 6d. a ton—he believed 9s. 2d., or practically 9s.—for these cement contracts. He mentioned a year ago that they had brought the coke trade into this bad state by accumulating such large stocks; and it was to be remembered that, while they were holding on against the cement manufacturers, the latter were bringing large quantities from the Provinces, and getting their supplies independently. This made the position in London much the worse in regard to coke. He had been in hopes, from what the Governor said at the last meeting, that by this time the large stocks held by the Company would have been gone; but he saw that on Dec. 31 last they held 154,000 tons.

The Governor remarked that it was all sold for delivery.

Mr. Livesey (continuing) said the Company pursued the same course during last year in asking for tenders; but the cement makers' combination did not tender. At all events, they received very few tenders from cement makers at 8s. a ton. This price was accepted by the Company from merchants and others; and they then offered a certain quantity to the cement makers at the same price, but not much more than half of what the latter wanted. When they had taken this quantity at 8s. a ton, the Company put the price up to 9s., which the cement makers would not pay. They went to the Provinces again, and brought large quantities to London; and the Chartered Company had at Christmas last 154,000 tons.

The Governor stated that it had been sold at 9s. 3d. a ton for export.

Mr. Livesey (continuing) stated that until this stock was cleared—whether it was sold or not—it would have a depressing effect upon the market. The cement makers, and everyone else, knew that this stock was held; and the Governor had told them that there was only another 100,000 tons to go abroad during the present selling season. What he maintained was that this method of dealing with the cement makers was not a proper one. They were as necessary to the gas companies as the gas companies were to them; and the proper way of treating with these gentlemen, who took such enormous quantities of coke from them, was to deal with them on the principle of mutuality. One of the leading men remarked to his (the speaker's) brother: "Whenever I go to Horseferry Road, I feel that I am going into battle." This feeling was all right from one point of view; but when they had to deal with the same men from year to year, a feeling which was not satisfactory was engendered. It did harm, and prevented them from getting a proper price for their residuals, which they might otherwise obtain. If the Chartered Company, instead of asking for tenders, had gone on the old principle of negotiating, they could have got 8s. 6d. a ton, and sold the whole of the coke which they had in hand. He supposed the reason why the conference between the Companies was not held was owing to the remarks which were made by himself; but there was an understanding that there was to be a conference on this question between the three leading Companies. It was put off until after the holidays; but meantime the Chartered Company applied for tenders, and it was useless to hold a conference after the Company had committed themselves in this way. He was not an enemy of the Chartered Company; and they were all bound up together. What was injurious to this Company, was injurious to all of them; and what they all wanted was steady, fair prices. He was bound to say that, in all his experience, he had never known anything like the fluctuation of prices that had prevailed in the past few years. He did not by any means say that this was all the fault of the Chartered Company; but he thought they had accentuated it. Prices had gone up and down in the most extraordinary way; and this had been most detrimental to all the gas companies. What the cement makers also required was something like regularity of prices. There was only one grain of comfort in this matter. In consequence of the large increase in the consumption of gas, there had been a little hardening in the price of coal. Had the companies been a little more prudent—had they rather over contracted, instead of under contracted for their coal—they would not have had to press so much for supplies. The price of pitch was about 25 per cent. less than it was last year, through its being used largely as a substitute for coal. The coalowners might come and say that the gas companies ought to give an increased price; but in that event, he thought they ought to be met with the reply that there was no advance in the value of residuals which would warrant an increase in the price of coal. He had not seen the evening paper to which the Governor had referred; and he knew nothing about their remarks. He desired to make one observation

with reference to the dividend. When shareholders were getting 12¾ per cent., they were naturally very well pleased; but this 12¾ per cent. was very misleading. He was therefore in agreement with his friend Mr. Rokeby Price, and strongly advocated the splitting of the stocks.

The GOVERNOR: We are quite with you in that.

Mr. LIVESEY (continuing) said that the Chartered Company had just raised £463,000 of capital, including premiums. This would pay to those who had invested in it £4 2s. 6d. per cent. Instead of gas shareholders getting 12¾ per cent., they were really only receiving about 4 per cent.; and he thought it would be well when a dividend was declared to make that point perfectly clear. Since 1876, all gas stock had had to be sold by auction. [The DEPUTY-GOVERNOR: Or by tender.] He hoped that the old Chartered Company would come through its time of trial and difficulty with success, and that the increase of business would prove to be more and more profitable—thus helping them to maintain their position.

Mr. ROKEBY PRICE desired to point out that, on the past half-year's working, they had a balance in hand of £417,934 after they had paid everything; and therefore the margin for the interest on the preference stocks was so enormous that no holder of any of these stocks, even of the lowest, need fear their being consolidated.

Mr. LIVESEY stated that, in the case of the South Metropolitan Company, they had a difficulty as regarded the consolidation question through there being two classes of stock—"A" and "B." The course pursued in the case of that Company, however, was effective in making them all agree; and they showed that the consolidation would be to the general interest of all. The "A's" and the "B's" both thought they were entitled to more than was proposed to be given them; but in consideration of the general advantage that would arise, they said they would sink their private views.

The GOVERNOR, in reply, said he hoped this would be the case when they applied to their stockholders to give their assent to a scheme of consolidation. It was their intention to apply to Parliament for a Bill next session, for the purposes of the open stock; but another object for going to Parliament was to get their preference stocks placed under the Trustees Act. This enabled trustees to invest in the preference stocks of a company which had for ten years paid 3 per cent. or upwards on its ordinary stock. He believed that, if they could get this authority, it would be very advantageous to the holders of the Company's ordinary stock. The only difficulty which had met them with respect to the preference stocks, arose in connection with the question of trustees. Trustees seemed to think that they could not take the new stock, and must remain outside; but if the scheme was carried through on the principle which had been suggested by Mr. Rokeby Price, when it would be left optional to take the new stock or not, he thought that the difficulty with trustees could be removed. With regard to Mr. Livesey's remarks, that gentleman was quite right in assuming that the Chairmen he had referred to in his opening remarks were Sir Frederick Mappin and himself. His complaint was that both these gentlemen might have got information from the Chartered Company which would have prevented them from falling into the mistakes which they did when making the statements to which he had referred. He was quite sure that Mr. Livesey would argee with him that the best plan for them to adopt, whether by conference or by letter, was to exchange information; but he fancied that Mr. Livesey attached more meaning to a conference than that. He gathered that Mr. Livesey thought that the conference might have affected the Chartered Company's policy as regarded inviting tenders for their coke. That policy was, however, deliberately entered on, and had been endorsed by the proprietors; and speaking for himself—and he believed for his colleagues also—they had not the slightest intention of departing from it. It had worked thoroughly well; and in a great concern like theirs, there ought to be no favouritism. Everyone, whether he was a cement maker or not, should tender on the same terms. This was their policy. He was sorry that Mr. Livesey did not like it; but they could not alter it to oblige him. He stated, with respect to the conference, that the Company's tenders went out before the speeches referred to were made; but that was not the case.

Mr. LIVESEY: The tenders were advertised before the time suggested for the conference.

The GOVERNOR: No; not before.

Mr. LIVESEY: You said: "Let the conference wait until after the holidays;" and after the holidays some correspondence took place between you and me on that matter.

The GOVERNOR: Yes; but before September you had made that complimentary speech. That is what we complain of. Continuing, he said he did not think it necessary to say anything further. There must always be differences of opinion between those who managed different concerns, though they might have a great deal in common; and the considerations which affected The Gaslight and Coke Company were not the same as those which affected Mr. Livesey's Company. The same rules might otherwise apply. He, however, made this proposition now—that at all times they would be ready to afford Mr. Livesey full information of what they were doing, and why they were doing it; and they only asked in return that Mr. Livesey should treat them in the same way. It was true that coke had come down; but its price had nothing to do with this Company's action, which throughout had been for the benefit of the Company. They had sold their coke outside for higher prices; and certainly they had had nothing to do with hardening the price of coal or lowering the price of pitch. He quite agreed with Mr. Livesey that the coalowners might seek to take advantage of the present boom to raise the price of coal; but they had a complete answer to such an attempt, as Mr. Livesey had said. As far, however, as this matter was concerned, they had not been bothered by the question of coal; and they would not enter on the question of coal contracts for some months to come.

The report was then adopted; and resolutions were afterwards passed declaring the dividends recommended and re-electing the retiring Directors—Colonel Makins, Mr. Ward, and Mr. John Orwell Phillips—and the Auditors.

The GOVERNOR, in acknowledging the re-election of his colleagues and himself, said they would in the future, as they had in the past, devote the best of their abilities and experience to carrying on the business of the Company with success. Mr. Livesey had said that he had not seen the evening paper and the charges which had been made against the Company. One charge was that they had wasted the assets of the Company and the dividends by entering into a "corner" in coke and sulphate. He gave that charge the most unqualified denial. They never entered into a combination with anyone with regard to their residuals, or anything else. They did so once, and they burnt their fingers; but they would never do it again.

A vote of thanks to the Governor and the Directors brought the meeting to a close.

SOUTH METROPOLITAN GAS COMPANY.

The Half-Yearly Report and Accounts.

The following is the report of the Directors of the above Company for the six months ending Dec. 31, which, with the accounts for this period, will be presented at the half-yearly general meeting on the 17th inst.:—

The Directors have the satisfaction to report that the profit on the half-year's working is sufficient to pay a dividend equal to the last. This result is due to an increase of 10 per cent. in the business, coupled with small savings on almost every item of expenditure over which the Company and its servants have control. The increase in gas-rental amounts to £43,000, of which, however, only some £10,000 is profit. Consequently this large addition to the revenue only meets one-half of the loss of £20,000 referred to in the next paragraph.

On the other hand, coke and ammonia have realized lower prices than ever; and there has also been a fall in the value of tar. Coke has produced only 4s. 7½d. per ton of coal used; while sulphate of ammonia, which sold in 1894 at £13 15s. per ton, gradually dropped to £7 in the last half year—the lowest price reached during previous depressions having been £10 per ton. Had the prices of products been even equal to the very low rates in the corresponding half year, there would have been an addition of £20,000 to the revenue; and if the values current in the half year to December, 1894, had been reached, the receipts for products would have been £56,000 more than they are.

The very low values of coke and pitch—the latter obtained in large quantities from tar, and used for fuel in place of coal—indicate a general low value for fuel, and give hope that, notwithstanding a hardening of the coal market during the pressure of the winter months, such hardening is only temporary, and will pass away on the approach of spring.

Beyond the losses on products, there is another very serious drain on the revenue, over which also the Company have no practical control—viz., the parochial rates, which stand in the present account at £29,480, against £20,815 in the corresponding half year. Six-sevenths of the smaller amount, and the whole of the addition, is a charge on the consumers of gas, and not on the shareholders. Therefore, if the rates are excessive, the gas consumers are unfairly taxed for the benefit of those ratepayers who use other illuminants. The additional charge of nearly £9000 in this half year is owing to increased assessments and higher rates in the pound. The Company have settled with the urban parishes as to the amount of their assessments; but the parishes in the suburbs put the figures so high, that there was, in the opinion of the Directors, no alternative but an appeal to the Sessions. These appeals are now pending; and consequently the Directors cannot go into details. They may, however, point out that, whereas the compound householder who is rated at £10 a year, more or less, and pays no rates directly—they being paid by the landlord—has a vote and a voice in the election of the rate-raising and spending authority, public companies—Railway, Water, Gas, Dock, Tramway, &c.—rated at £100,000 or more (much more in some cases) have no vote or voice in the matter. This is indeed a case of taxation without representation, and should, the Directors think, be brought before the Royal Commission on Rating appointed in August last "to inquire into the present system under which taxation is raised for local purposes, and to report whether all kinds of real and personal property contribute equitably to such taxation, and, if not, what alterations of law are desirable to secure that result." The system of rating public companies is very uncertain, and opens the door to endless disputes, which involve heavy expenses. Further, if some plan of direct rating could be adopted, to make the compound householders feel the burden of the rates they now pay indirectly, they would have an interest in economical administration which is at present lacking.

Under these adverse circumstances, the Directors consider the results of the half-year's working are better than might have been expected. They are glad to think this result is due to the heartiness with which the officers and workmen endeavour to promote the Company's interest. They recommend that a dividend at the rate of 5¾ per cent. per annum be paid on the ordinary stock of the Company; but the profits are not sufficient to enable any addition to be made to the reserve fund this half year.

In accordance with the Act of Parliament, two Directors (Mr. John Ewart and Mr. Robert Morton) and one Auditor (Mr. Charles Mortimer) go out of office by rotation. They are all eligible for re-election, and offer themselves accordingly.

The accounts are in the usual form.

Statements Nos. 1 and 2 show the total amount of capital raised at the close of the past year. The paid-up stock stood at £5,475,000; and the loan capital, at £850,000. Since June 30, 1896, the amount raised on debentures has been increased by the issue of £30,000 of 5 per cent. stock, the premium on which was £21,505.

Statements Nos. 3, 4, and 5—the capital, revenue, and profit and loss accounts—are given in full on p. 302.

Statements Nos. 6, 7, and 8 show that the reserve fund stood at £93,278, the renewal fund at £15,587, and the insurance fund at £43,711, on Dec. 31, compared with £84,047, £15,216, and £43,134 on June 30.

Statements Nos. 9 to 11, furnishing particulars as to the manufacturing operations of the Company, and No. 12, the general balance-sheet, are given in full.

ACCOUNTS OF THE SOUTH METROPOLITAN GAS COMPANY FOR THE HALF YEAR ENDED DEC. 31, 1896.

No. 3.—CAPITAL ACCOUNT.

Dr.

	£ s. d.	£ s. d.
To Capital account to June 30, 1896	..	3,468,137 3 8
Increase by conversion	3,285,000 0 0	
Less premium capital	364,325 0 0	2,920,675 0 0
Expenditure during half year to Dec. 31, 1896, viz.—		6,388,812 3 8
New buildings and machinery in extension of works	17,955 18 8	
New and additional mains and services	14,404 3 9	
Do. meters	20,095 18 11	
Do. stoves	16,321 19 8	68,778 1 0
Total expenditure	..	6,457,590 4 8
Balance	..	139,038 15 4
		6,596,629 0 0

Cr.

Description of Capital.	Certified to June 30, 1896.	Received since that Date.	Total to Dec. 31, 1896.
	£ s. d.	£ s. d.	£ s. d.
By A stock	500,000 0 0	..	1,486,250 0 0
B stock	1,350,000 0 0	..	3,138,750 0 0
C stock	340,000 0 0	..	850,000 0 0
Debenture stock, 5 per cent.	820,000 0 0	30,000 0 0	850,000 0 0
			6,325,000 0 0
Premium capital (Debenture stock.)	250,124 0 0	21,505 0 0	271,629 0 0
			6,596,629 0 0

No. 4.—REVENUE ACCOUNT.

To Manufacture of gas—		
Coals into store, including cost of petroleum spirit for enriching and including £19,968 4s. 8d. for labour (see Account No. 9)	£231,714 11 8	
Purification, including £5595 4s. 8d. for labour	13,283 3 3	
Salaries of Engineer and Officers at works	6,016 2 2	
Wages (carbonizing)	52,694 9 4	
Repairs and maintenance of works and plant, including £37,947 14s. 0d. for labour, less £1325 13s. 6d. received for old materials	62,626 4 10	
		£366,334 11 3
Profit sharing		7,000 0 0
Distribution of gas—		
Repair, maintenance, and renewal of mains and service-pipes (labour, £12,920 8s. 9d.)	£18,494 14 1	
Salaries, &c., Officers and Rental Clerks	11,064 1 9	
Repair, &c., of meters (£1085 4s. 10d. for labour)	9,858 19 4	
Repair, &c., of stoves (£3114 5s. 2d. for labour)	7,125 19 4	
Gas fittings (labour)	2,734 0 9	
		49,277 15 3
Public lamps—lighting and repairing, including £5889 18s. 10d. for labour		6,345 8 11
Rents, rates, and taxes—		
Rents payable	£794 6 5	
Rates and Taxes	29,480 9 5	
		30,274 15 10
Management—		
Directors' allowance	£1,750 0 0	
Salaries of Secretary, Accountant, and Clerks	2,603 3 3	
Collectors	7,334 1 1	
Stationery and printing	1,715 15 2	
General charges	3,212 16 1	
Company's Auditors	112 10 0	
		16,758 5 7
Law charges		1,069 11 2
Parliamentary charges		1,311 12 1
Bad debts		1,195 2 6
Pensions and officers' and men's superannuation and sick funds		2,857 11 11
Gas Referees and Official Auditor		216 10 8
Total expenditure		£482,551 5 2
Balance carried to net revenue account (No. 5)		164,786 5 1
		£647,337 10 3

By Sale of gas—		
Michaelmas, at 2s. 3d. per 1000 feet	£156,634 2 2	
Christmas, at 2s. 3d. per 1000 feet	285,428 15 11	
	£442,063 18 1	
Public lighting and under contracts (see Statement No. 11)	31,428 1 4	
		£473,490 19 5
Meters in use—		
Company's meters at rent: Ordinary, 83,420; prepayment, 56,902	£14,662 13 4	
Stoves and fires at rent: Ordinary, 32,611; prepayment, 42,746; fires, 7618	12,216 0 4	
		26,878 13 8
Residual products—		
Coke, less £16,453 5s. 0d. for labour, &c.	£100,229 11 2	
Breeze, less £2460 0s. 8d. for labour, &c.	3,709 0 3	
Tar, less £389 4s. 8d. for labour, &c.	22,600 3 6	
Ammoniacal liquor, less £591 17s. 6d. for labour, &c.	10,722 5 11	
Sulphate of ammonia, less £621 16s. 3d. for labour, &c.; £2449 14s. 9d. for acid, &c.	8,091 8 3	
		145,352 9 1
Rents receivable		1,542 13 1
Transfer fees		72 15 0
Total receipts		£647,337 10 3

No. 5.—PROFIT AND LOSS (NET REVENUE) ACCOUNT.

Interest on temporary loan and deposits		£1,756 3 4
Interest on debenture stock		20,750 0 0
Value of Stock cancelled in accordance with Company's Act of 1896		10,975 7 2
Balance applicable to dividend on the ordinary stock		145,068 18 6
		£178,550 9 0
Balance from last account		£164,102 13
Less—Dividend for half year ended June 30, 1896	£142,350 0 0	
Divisible profits carried to reserve fund	8,212 10 0	
		150,562 10 0
		£13,540 3 1
Amount from revenue account (No. 4)		164,786 5 1
Interest on Bankers' balances		224 0 10
		£178,550 9 0

No. 9.—STATEMENT OF COALS.

Description of Coal.	In Store, June 30, 1896.	Received during the Half Year.	Carbonized during the Half Year.	Used during the Half Year.	In Store, Dec. 31, 1896.
	Tons.	Tons.	Tons.	Tons.	Tons.
Newcastle coal	43,924	467,667	448,541	414	62,636
Cannel coal	1,651	..	109*	..	1,542
	45,575	467,667	448,650	414	64,178

* 246,851 gallons of petroleum spirit used as a substitute for cannel.

No. 10.—STATEMENT OF RESIDUAL PRODUCTS.

—	In Store, June 30, 1896.	Made during Half Year.	Used in the Half Year.	Sold in the Half Year.	In Store, Dec. 31, 1896.
Coke—cwt.†	301,520	5,507,180	1,135,946	4,276,191	396,563
Breeze—yards	6,582	99,754	25,240	71,946	9,150
Tar—gallons	501,040	4,387,883	24,594	4,126,205	738,130
Ammoniacal liquor—butts.	8,236	138,733	30,736	89,382	26,851

† 1 cwt. of coke about equals 1 sack of 4 bushels, under Weights and Measures Act, 1878.

No. 11.—STATEMENT OF GAS MADE, SOLD, ETC.

Description of Gas.	Quantity made.	Quantity Sold.			Quantity used on Works, &c.	Total Quantity accounted for.	Quantity not accounted for.	Number of Public Lamps.
		Public Lights (estimated).	Private Lights (per Meter).	Total Quantity Sold.				
	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	
Common	4,578,643	225,466	3,961,084	4,186,550	62,991	4,249,541	329,102	20,026

No. 12.—BALANCE-SHEET.

To Capital—		
Balance—per account No. 3		£139,038 15 4
Reserve fund—per account No. 6		93,278 5 1
Renewal fund—per account No. 7		15,587 7 10
Insurance fund—per account No. 8		43,711 1 0
Net revenue account—for balance, per account No. 5		145,068 18 6
Debenture interest, for amount due to Dec. 31, 1896		20,058 6 8
Sundry tradesmen, for amount due for coals, stores, and sundries		41,519 17 4
Deposits by consumers		28,636 5 2
Dividend account (outstanding)		2,225 11 1
Debenture account "		61 13 11
Workmen's bonus and savings deposited with the Company		34,991 14 5
Officers' superannuation and guarantee funds		28,412 11 4
Ordinary stock subscriptions		1,294 15 0
Temporary loan		55,000 0 0
		£648,855 2 8
By Cash at Bankers		£19,614 16 5
Amount invested (reserve fund, £54,744 11s. 8d.; renewal fund, £15,132 14s. 5d.; insurance fund, £41,969 13s. 2d.)		111,846 19 3
Cash in hand for sundry payments		800 0 0
Stores in hand—		
Coals and enriching materials	£33,753 14 9	
Coke and breeze	8,719 4 7	
Tar, sulphate, and ammoniacal liquor	9,302 16 9	
Sundry stores	112,671 5 6	
		164,447 1 7
Accounts due to the Company—		
Gas meter and stove rental, quarter ending Christmas, 1896	£280,149 7 5	
Arrears outstanding	1,065 15 1	281,215 2 6
Coke and other residual products		31,017 16 9
Balance due for gas-fittings		87,039 15 11
Sundries		2,873 10 8
		£648,855 2 8

BRENTFORD GAS COMPANY.

The Half-Yearly Report and Accounts.

The statement of accounts to be presented at the half-yearly meeting of the above-named Company next Friday shows a sum of £60,379 available for division; and, as already mentioned in the "JOURNAL," the Directors will recommend dividends at the rates of 5, 12, and 9 per cent. per annum. In the six months ending Dec. 31, there was an expenditure of £11,336 on capital account; £7085 being for new and additional meters and stoves, £3303 for mains and services, and £948 for new buildings and machinery. This outlay brought the total expenditure on capital account up to £896,923; leaving an unexpended balance of £53,057. The capital was increased by the issue, in November, of £30,000 of new stock, which produced £63,001; the whole amount having been tendered for above the minimum price named in the conditions. The sale of gas produced £103,383, as compared with £94,064 in the corresponding six months of 1895; the meter and stove rental being £6788, against £5499; the returns from residuals, £22,436, against £22,413; and the total revenue, £132,675, against £122,064. Less was obtained for coke and ammoniacal liquor; but more for breeze and tar. The manufacture of gas cost £70,287, as compared with £66,677—more being paid for coals, purification, and salaries, and less for wages and maintenance; distribution came to £11,171, against £9517; and the total expenditure was £95,706, against £89,472. The balance carried to the profit and loss account is £36,968; whereas this time last year it was £32,592. In the manufacture of gas, 74,388 tons of coal and cannel were carbonized, as compared with 66,000 tons in the second half of 1895. Of the 747,656,000 cubic feet of gas made, 699,741,000 cubic feet were sold, and 712,241,000 cubic feet accounted for. The following are the estimated quantities of residuals produced: Coke, 49,592 tons; breeze, 6200 tons; tar, 801,479 gallons; ammoniacal liquor, 20,801 butts of 108 gallons, including 478 butts purchased.

In their report, the Directors state that the sale of gas in the past half year was 10 per cent. more than in the corresponding half of 1895. The consumers of gas by the prepayment meter system rapidly increase in number. On Dec. 31, 1896, there were let on hire 8157 of these meters, as compared with 5006 on Dec. 31, 1895; being an increase of 3151, or at the rate of 62·9 per cent. In order to meet the rapidly increasing business of the Company, the manufacturing plant will have to be extended; and the Directors purpose providing at the Brentford works further gas-producing apparatus, by which 1,200,000 cubic feet of gas per diem can be made if required. Additional extensions to the Southall works will also probably have to be carried out later in the year. The entire plant of the Company, under the supervision of the Engineer-in-Chief (Mr. Frank Morris, M.Inst.C.E.), is in excellent order. Mention is made in the report of the successful appeal by the Directors against the assessments of the Company's property in the parishes of the Brentford Union, whereby they obtained the appreciable reduction of £2343 upon the rateable value.

PROVINCIAL GAS AND WATER COMPANIES.

We commence to-day our usual notes as to the progress during the past half year of Gas and Water Companies in various parts of the country whose reports and accounts come to hand about this time.

Gas Companies.

At the annual meeting of the Chester United Gas Company yesterday, the accounts presented showed a balance of £4024 to the credit of the profit and loss account for the half year ending Dec. 31. After providing for interest on the loan capital and dividend on the preference stock, statutory dividends were declared, and there was left a balance of £661 to be carried forward. The revenue amounted to £17,443; the expenditure, to £13,097—leaving £4346 to go to the profit and loss account. There was a very substantial increase in the gas-rental in the past six months, and a slight rise in the returns from residuals. The inauguration of the electric light undertaking of the Corporation took place on Dec. 17; and a number of business premises and public institutions in the central parts of the city and certain of the main thoroughfares have been supplied with the new illuminant; but up to the present the demand for gas continues to be in excess of that for the corresponding period of last year. In the last six months of 1896, there was an increase of 9¾ million cubic feet as compared with the second half of 1895; and for the first month of the present year the increase has been more than 2 millions. Under the supervision of the Engineer and Manager (Mr. R. Hunter), the works and mains have been kept in a thorough state of efficiency.

In the past half year, the revenue of the Dorchester Gas Company was £3443; and the expenditure, £2273—leaving £1170 to go to the profit and loss account. The balance available for division—£1212—is sufficient to pay the usual dividends, and enable the Directors to replace the sum of £100 taken from the reserve fund.

The receipts of the Town and County of Poole Gas Company in the six months ending Dec. 31 amounted to £3784; the expenditure being £2368—leaving £1416 to go to the profit and loss account, as compared with £1221 for the corresponding period of 1895. The amount available for division is £5156, which allows of the payment of maximum dividends.

The Pudsey Gas Company's business continues to develop in a satisfactory manner; the increase in consumption during the past year having been 5·11 per cent. An interim dividend was paid at the rate of 8½ per cent. per annum; and a like payment is to be made for the past half year. In September, the Directors increased the capital by the sale of £3000 of consolidated 7 per cent. stock; and a similar amount is to be offered to the public during the current year.

The balance of the profit and loss account of the Shanklin Gas Company, Limited, for the past year was £1884; and at their meeting last Wednesday, a dividend of 8 per cent. on the original shares and of £5 12s. per cent. on the ordinary shares was declared. The Company have adopted prepayment meters, with satisfactory results. The Directors, in their report, recorded their appreciation of the services rendered by the Secretary and Manager (Mr. F. C. Taylor) and staff.

The half-yearly general meeting of the York United Gas Company was held last Thursday—Mr. J. F. Taylor in the chair. The Engineer and Secretary (Mr. Charles Sellers) submitted the report of the Directors, which showed that the total profit for the six months ending Dec. 31 amounted to £6732. The Directors recommended the usual half-year's dividend of 5s. per share, equal to 5 per cent. upon both the old and new shares, and stated that they had resolved to reduce the price of gas by 2d. per 1000 cubic feet—thus lowering the scale to 1s. 8d., 1s. 9d., and 1s. 11d. The Chairman, in moving the adoption of the report, said there were two features in it which were very satisfactory—the increase in the gas consumption of 5 per cent., and the fact that the expenses had not had to cover anything but the ordinary working. They had been fortunate with their coal contracts for the last two years, which enabled them to make the present reduction in the price of gas; but the speculative sulphate market had baffled their calculations. Still, the Directors hoped on; and they thought the price had bottomed, and now presented a more healthy appearance than it had done for some time. With regard to the increased consumption of gas, this arose not only from its extended use for lighting and heating purposes, but from the growth of the city, which would necessitate the laying of new mains or the enlargement of the existing ones. He concluded by emphasizing the importance of gas consumers using only the best burners. Generally speaking, they were, he said, too indifferent upon this matter; and, rather than change their burners, they passively threw the blame upon the gas, which, as a rule, did not deserve it. Their Engineer had just informed him—and it would be welcome news to gas consumers—that the patent for the Welsbach burner would expire early next year; so that they were practically on the eve of free competition in these burners, and, as a consequence, much lower prices might reasonably be expected. Moreover, Messrs. G. Bray and Co. also were about to bring before the public an invention which, for cheapening and increasing the light-giving power of gas, would effect a great improvement. Mr. T. Bulmer seconded the motion; and it was carried. The dividend recommended having been declared, the Lord Mayor (the Right Hon. Alderman C. A. Milward) proposed a vote of thanks to the Chairman and Directors. Referring to the electric light, he said it appeared that the shareholders in the York Gas Company need not fear its advent; but they might have to face the matter some day, and possibly soon. His opinion, however, was that the Corporation could not afford to undertake its supply at present; and the wisest policy was not to surrender their rights to any company, but to go to the Board of Trade and ask for further extension of time to enable them to take the light into their own hands when it was introduced into the city, and not force the citizens to put it into the hands of a company. The motion was carried unanimously.

Water Companies.

The improved trade of the town of Boston (Lincs.) has had a beneficial effect on the finances of the Water Company. Last year they received £237 more, without practically any additional outlay. A dividend of 9 per cent. is to be paid; and £246 is to be added to the reserve fund—making it £1524.

The Directors of the Cambridge Water Company had nothing of an unusual character to lay before the shareholders at their recent half-yearly meeting. The business continues to steadily advance; the report of the Engineer (Mr. W. W. Gray) showing that during the six months connections had been made to 199 additional premises, the increased rental derivable from which is £214 per annum. The total number of premises now supplied is 14,422. Trunk main extensions have been nearly completed at a cost of £4000. Dividends at the rates of 10 and 7 per cent. are to be paid.

The annual meeting of the Carnforth Water Company was held last Wednesday. The accounts showed a balance of £1030 available for dividend, which, at the rate of 7 per cent., absorbed £945. It is proposed to purchase land adjoining the present storage reservoir, and increase the storage capacity by 12 million gallons. This will cost about £1000.

The report of the Directors of the Consett Water Company shows the finances to be in a healthy state. The revenue in the past year has increased by £610. After deducting the interim dividend, and payment of interest on bonds, income-tax, and management expenses, there remains an undivided profit—including £2548 brought forward—of £9533, out of which the Directors recommend the payment of a dividend of 4 per cent. per annum on the preference shares, and 6½ per cent. on the ordinary shares. This will absorb £6074; and the balance of £3459 is to be carried forward. The construction of four new filter-beds at Honey Hill was sufficiently advanced in December last to allow of three of them being brought into use; and the laying of a new main having been completed, filtered water was supplied throughout the Company's district on the last day of the year.

The Directors of the Whitby Water Company propose the payment of a dividend of 8 per cent. for the past year on the ordinary shares. In their report, they inform the shareholders that the Randy Mere reservoir will have to be repaired at an estimated expense of about £9000, which will necessitate the issue of further capital.

The rental of the York Water Company in the second half of last year amounted to £8778; and the sum available for distribution among the shareholders allowed of the payment of dividends at the rates of 5 and 3½ per cent. per annum on the preference shares, and 10 and 7 per cent. per annum on the ordinary and new shares. The Directors have lately added to the plant by the erection of new pumping machinery and boilers, under the superintendence of their Engineer (Mr. W. H. Barbey); and they consider that ample provision has now been made to meet the present and increasing demand for the water supplied by the Company.

The Gas Question at Malvern Link.—The poll of the ratepayer of Malvern Link on the subject of the acquisition of the Malvern Link Gas-Works by the District Council resulted in 1339 votes in favour, and 629 against the proposal; giving a majority of 710. At a special meeting of the Council held last Wednesday, the resolution previously come to, to promote the Bill was duly confirmed.

THE WATER GAS AGITATION AT LIVERPOOL AND BIRKENHEAD.

The Liverpool Gas Company's Defence.

The Chairman of the Liverpool United Gas Company (Mr. Edward Lawrence) has addressed the following letter to the Garston Local Authority in reply to their recent communication to the Directors on the subject of the supply of water gas in the district (see *ante*, p. 191):—

Liverpool United Gaslight Company.
Jan. 30, 1897.

Gentlemen,—Your letter of the 22nd inst. has received the careful attention of the Directors of this Company, who, after full consideration, and with a desire to meet objections which had been raised against the use of pure carburetted water gas in the district, have determined to henceforth mix same with the ordinary cannel gas manufactured by the Company.

The Directors cannot, however, entertain the suggestion to abandon the manufacture of carburetted water gas, the advantages of which are so generally recognized that it has been already successfully adopted in several of the chief cities and towns of the United Kingdom, not only by gas companies, but by municipal authorities, while throughout the United States of America the system has been for many years in operation, providing about 70 per cent. of the present gas supply in that country.

In connection with this latter observation, it is useful to refer to the published statement that in a petition signed by 225 medical practitioners in Boston (which is now supplied with carburetted water gas exclusively), praying for the repeal of a law which had been previously passed to prohibit the use of this description of gas in the city, the supply of such gas is declared to be "no more dangerous to health and life than coal gas." This opinion has been confirmed by most eminent scientists and chemists in America and this country, among whom may be specially named Dr. Edward Frankland, of the Royal College of Chemistry, and Dr. Alexander Crum Brown, Professor of Chemistry in the University of Edinburgh, the last-named of whom was recently engaged to advise the public gas lighting authority of Edinburgh on several points relating to carburetted water gas, the first of which was the degree of risk of poisoning incurred by the public by the use of carburetted water gas as against ordinary coal gas. Professor Crum Brown reported that the difference as between the two gases "is small when compared to the total risk," and that "the increased amount of carbonic oxide is, therefore, no real objection to the introduction of carburetted water gas for illuminating purposes in place of coal gas." Before presenting this report, Professor Crum Brown had made a careful examination and analysis of the gas manufactured by this Company at Garston. As the result, the Edinburgh authorities have just erected similar works for the supply of carburetted water gas in their district.

With regard to the "bad smells" incident to the manufacture of the gas, it is well known that disagreeable odours are unavoidable in the manufacture of all illuminating gas, but the Directors are always ready to adopt all practicable means in their power to reduce the offensiveness at Garston as well as at the other works of the Company.—I am, gentlemen, your obedient servant,

E. LAWRENCE, Chairman.

Garston Still Unsatisfied.

The foregoing letter was read and discussed at the meeting of the Garston District Council last Tuesday.

The CHAIRMAN (Mr. J. E. Sheppard) said that perhaps it was to be regretted the Company did not supply a larger proportion of coal gas, because they all knew from the alteration that had been made recently in the light that there had been a considerable quantity of coal gas mixed with the water gas.

Mr. J. RIGBY, the Chairman of the Sub-Committee appointed to consider the water-gas question, said he believed carburetted water gas was used more largely in America than in England, in consequence of the quality of the coal gas made there. He understood that the coal in America would not make suitable and proper gas, or even safe gas, as was the case in England. This would do away with the Company's argument on that point. Then as regarded the scientific aspect of the question, he believed Professor Haldane was supposed to be the chief authority on the subject; and he should pit his opinion against those of the Edinburgh and American authorities [see *ante* p. 245]. As to the gas itself, they must all be thankful for the increased illuminating power supplied during the past few days. He understood that the proportion of coal gas now distributed was 25 to 30 per cent.; and this percentage of coal gas, assuming that the water gas was the same quality as before, gave the immense improvement they had had during the past few days. He thought it was proved to a demonstration how unfairly the district had been treated by the Company for the past year or two. As to the future, he understood (again speaking from hearsay) that it was the intention of the Company to give them 50 per cent. of coal gas mixed with water gas; but that would not meet their case at all adequately. Taking the question on the lowest ground, they paid the same price as anybody else in the district; and they ought to be treated the same. Hitherto he believed water gas had been supplied by the Company to the Garston district alone; and he contended it should be distributed over the whole of the Company's area, with an equal percentage to each district. He did not think the Council ought to be satisfied with anything less than that. As pointed out in their letter to the Company, there was a danger in mixing the gases, because people might relax their precautions against the water gas; and as they had no control over the proportion of the gas to be supplied—which might vary from 25 to 95 per cent.—the health and lives of the people, especially those inhabiting lower-class houses, might be jeopardized. He hoped everything possible would be done to induce the Company to meet them a little more.

Captain TURNER thought the Company's letter was altogether evasive. They were not controlled by what was done in America; and this point had been fully answered in their previous letter to the Company, when they pointed out that in America the gas-fittings were severely tested by the authorities before the gas was supplied. The danger had only been slightly modified by the Company; and when they considered that not 25 per cent. of the gas-fittings in the houses in the district were free from some escapes, they would see the necessity for action being taken in this matter.

Mr. J. RAWLINSON inquired if the Council had power to see the Act under which the Company were working, to ascertain whether they were empowered to supply water gas.

The LAW-CLERK (Mr. P. F. Garnett) replied that there was no restriction upon the Company as to what sort of gas they made.

Mr. C. STOPFORD remarked that the inhabitants of Garston were willing to pay for coal gas; and it ought to be supplied to them. The Company had no more right to adulterate their gas than a tradesman had to adulterate sugar with sand.

Mr. RIGBY moved that the Council send a letter to the Company, intimating that their intentions were not satisfactory, and requesting them to reconsider the matter with a view to supplying not less than 75 per cent. of coal gas to the Garston district.

Mr. STOPFORD seconded the motion, which was carried.

The Question Discussed by the Birkenhead Town Council.

The minutes presented by the Gas and Water Committee at the meeting of the Birkenhead Town Council last Wednesday did not contain any reference to the agitation; but, recognizing the importance of making a public statement in regard to it at the earliest opportunity, Alderman Bloor, the Chairman of the Committee, in moving the adoption of the minutes, devoted the main portion of his remarks to the question.*

Alderman BLOOR said no doubt he was expected to say something as to the scare which a certain section of the Liverpool Press had attempted to get up, aided by one or two timid but clever correpondents. With the view of refuting the charge that water gas had been secretly and surreptitiously introduced into Birkenhead, he gave a sketch of the proceedings which ended in the adoption of the system. The several dates when the question was before the Committee and the Council were supplied by the Alderman, who said he failed to see how any greater publicity could possibly have been given to the matter. The final report which was presented contained particulars of the plant and manufacture, showing that some addition was necessary, and pointing out that to erect plant for water gas would cost about £12,000, against double the cost for new coal-gas plant. The report concluded by giving certain reasons why water-gas plant was recommended. The advantages set forth were: (1) Securing better prices on the sale of coke, as they would make less and use a large quantity of that produced for the manufacture of water gas, so that the remainder would not exceed the demand, and the prices would be bigger than formerly; (2) no smoke; (3) ease and rapidity of production of large quantities of gas at short notice; (4) considerable saving in the cost of labour, amounting to about 2d. per 1000 cubic feet; (5) decreased capital expenditure; and (6) that a mixture of water gas would prevent the accumulation of naphthalene in the pipes. This report came before the Council, and was confirmed. Tenders were then entered into, and the works erected. The Committee took their stand on the report of their Gas Engineer (Mr. T. O. Paterson), and adhered to the position that water gas was preferable. They had introduced it; and they meant it to stay. The question of the quality of the gas was one for experts; but he took an ordinary common-sense business view of the matter. The whole thing was fought in the United States nearly a generation ago; and when they found 70 to 75 per cent. of the total gas made in America and Canada was water gas such as they were making, he was quite satisfied that it was harmless. At home, water gas had been adopted in most of the principal towns. In some of the United States, laws were passed prohibiting the manufacture of the gas; but every one had been since repealed—in one town on the petition of 253 doctors, who all said the gas was absolutely harmless. The Gas Committee were firmly convinced no harm could accrue from the introduction of the gas if the consumers' fittings were looked after just as carefully as formerly. Under equal circumstances, water gas was not a whit more dangerous as supplied than ordinary coal gas.

Alderman LEES seconded the motion.

Mr. COOK moved that minute No. 5 of the proceedings (which simply dealt with the sending out of copies of Mr. Paterson's report) should be referred back. He said that at the present time they were face to face with a scare. The Gas Committee were traders; and, like every other trading concern, they ought to have the confidence of their customers that the goods with which they were being supplied were what they professed to be. A month ago he had given Alderman Bloor an opportunity of making a statement which might have given that confidence; but the opportunity was not taken; and since then there had been various statements in the Press and elsewhere which had quite destroyed confidence. He had been told a special report was being prepared; and now that he had the report before him, he must say it was a case of special pleading of no ordinary importance. Some of the points were put so very curiously that it left a strong impression that much might be said on the other side. The Committee had asked for a report to justify their action from the gentleman on whose advice they took that action. (Laughter.) He thought their Gas Engineer would have done better by starting his report otherwise than with a diatribe against the Press of a neighbouring city. What on earth did it matter where the public got their idea that the gas was deleterious to health as well as dangerous to vitality, injurious to fittings, and indifferent as to heat? The idea was there; and they had to deal with it. Mr. Cook went on to quote the expert opinions given in the report, and said not one of them was dated, although he happened to know that most of them were nineteen years of age.

Alderman BLOOR: That only shows how out of date and behind the times this discussion is.

Mr. COOK proceeded to say that the duty of the Council was to satisfy themselves and the community, whose interests they had to guard, that there had been nothing done which might prove injurious to the latter in any way. He would like to suggest that an independent expert should report to the Committee on the whole question, observing the following points: (1) What had been the constituent parts of coal gas supplied to the town? (2) What were the constituents of pure water gas? (3) What were the constituents of the proposed mixture? He

* A report by the Corporation Gas Engineer (Mr. T. O. Paterson, M.Inst.C.E.) on the objections to water gas was published in the "JOURNAL" last week, p. 244.

would also ask the Committee for a definite statement as to what would be the proportion of the mixture. Also, he would ask for expert opinion as to the effect of the gas on fittings and on incandescent mantles; also, as to the loss of heat in fires and cookers and how did it stand as to use for driving gas-engines. They desired to assure the public that nothing dangerous or injurious was supplied to them.

Mr. MILLER, in seconding the amendment, remarked that Alderman Bloor had shone most on the financial side of this question; but when it came to the point of health and life, he set the experts against each other. Unless the confidence of the public was restored, the effect would be seen very plainly in next quarter's gas bills.

Mr. A. M. ROBINSON supported the amendment.

Mr. GAMLIN observed that it was a great pity Alderman Bloor had not spoken of the danger of water gas when the question was originally mooted in the Council.

Mr. R. R. HUGHES considered they should have a definite statement as to the maximum proportion of water gas which the Committee would use, as an assurance on that point would largely restore confidence in the public mind. At present, if the total water gas were used, they might be supplied with 66 per cent. of water gas and 33 per cent. of coal gas.

Mr. OATES said they had been definitely assured by the Gas Engineer of Belfast (Mr. J. Stelfox) that there was no danger from water gas. The whole of the scare had arisen from two deaths in the neighbourhood. But in one case the man had been in the last stage of consumption; and in the other, the lady regained consciousness sufficiently to state that she had recovered from the gas, and it was the shock that killed her. (Laughter.) Leakages of water gas were no more dangerous than of coal gas, though a fatal overdose of the former caused death sooner than the latter.

Messrs. Thompson and Kenny supported the amendment.

Alderman BLOOR, replying to the discussion, said he had not smartness enough to foresee the scare which had taken place since the last meeting. He was sorry every member of the Council had not read a paper, which had appeared in the "JOURNAL OF GAS LIGHTING"—by Mr. A. G. Glasgow, who was one of the best living authorities on the matter. Mr. Cook's proposal simply meant one more expert opinion among many. He (the speaker) did not believe in spending a guinea or a shilling in fighting again the battle which had been fought and won twenty years ago. The Committee had given three years' attention to the matter; and, on all grounds, they thought it advisable to introduce water gas. One great advantage was its readiness for emergency; and in case of strike, the Engineer and the Committee could keep the town in gas for months. Mr. Gamlin had apparently not read his report of April last, in which several paragraphs were devoted to the question of danger—one pointing out that, in case of leakage, water gas became offensive long before it became dangerous. The Committee did not admit the truth of the exaggerated panic-stricken statements which had been made. He could give no assurance as to the proportion of mixture; but so far out of 61,000,000 cubic feet of gas supplied 13,750,000 had been water gas, a proportion of 22·35 water gas to 77·65 coal gas. If the Council instructed the Committee that they must not exceed a certain proportion, of course they would loyally obey. Continuing, he quoted a number of towns to show that the average proportion was from 25 to 45 per cent., though in certain cases the carburetted water gas had been sent out pure.

A short conversation followed with regard to putting the amendment, seeing that copies of Mr. Paterson's report had already been distributed; but it was urged that the vote was simply for the purpose of securing an expression of opinion.

The amendment was defeated by 24 votes to 21; and the minutes were adopted.

A correspondent of one of the local papers suggests that, in order to put an end to the supply of water gas in Birkenhead, the ratepayers should refuse to vote for any councillor in favour of its use. "Coal gas," he says, "is what we pay for; and I am only expressing the wishes of the large majority of ratepayers when I say we will have it."

THE GAS QUESTION AT SOUTHPORT AND BIRKDALE.

At the Meeting of the Birkdale District Council last Tuesday, the Lighting Committee presented a resolution expressive of the willingness of the Council to receive from the Southport Corporation an offer for a settlement of the differences between the two bodies on the basis suggested by Professor Lewes at the Local Government Board inquiry—viz., that the standard quality of the gas should be that of London, and that it should be supplied under the Metropolitan regulations; and a copy of the resolution was sent to the Corporation. Later in the week, deputations from the two authorities had meetings; and we understand that terms have been come to on all points except the question of price. The Birkdale authority finally submitted their terms of agreement, and these were laid before the Gas Committee of the Corporation yesterday, with the view of an amicable settlement of the differences between the parties before the resumption of the inquiry to-day; but none was arrived at.

The Pay of Gas and Water Labourers at Oldham.—The Gas and Water Committees of the Oldham Corporation have, at a joint meeting, passed a resolution, granting an application from the men in the employ of both departments as main and service layers for an advance in wages from 5½d. to 6d. per hour. The resolution will have to go as a recommendation to a joint meeting of all the Corporation Committees employing labourers, before it is carried into effect.

Incandescent Gas Lighting at Belfast.—The Belfast Corporation Gas Committee have authorized their Manager (Mr. J. Stelfox) to have incandescent burners fixed to about 150 street-lamps, and have agreed to allow the Incandescent Gas-Light Company to fit their burners on a large lamp at Castle Junction, free of cost to the Corporation. The Committee have ordered the lamps in Donegall Street from Commercial Buildings to St. Patrick's Chapel to be fitted with 60-candle burners, and from the chapel to Carlisle Circus with 100-candle burners.

THE DUPLICATION OF THE WATER-GAS PLANT AT BIRMINGHAM.

At the Meeting of the Birmingham City Council last Tuesday—the LORD MAYOR (Mr. J. Smith) presiding—the Gas Committee presented the report dealing with the extension of the water-gas plant, a summary of which and an illustrated description of the existing plant, appeared in the last issue of the "JOURNAL." With the view of preparing the members for the discussion, Alderman Pollack had escorted a large number of them to the Saltley works the previous day, for the purpose of seeing the new plant in operation.

Alderman POLLACK, in moving that the Committee be authorized to expend £43,000, in the duplication of the water-gas plant, reminded the Committee that two months ago he drew attention to the phenomenal consumption of gas during the first six months of the present financial year. The increased output then, as compared with the corresponding six months of the previous year, was 165 million cubic feet, or 11½ per cent. This percentage had still further been increased during the last quarter of 1896, when, in comparison with the corresponding quarter of 1895, it was 201½ million cubic feet, or 14½ per cent. The present quarter was likely to result in a similar addition; and it was highly probable that, at the end of the financial year, they would have to record an increase of certainly not less than 500 million cubic feet, or, more probably, 550 millions, as against 235 millions—the largest previous annual increase—in 1890-91. In December, 1895, when the maximum weekly output reached 148 million cubic feet, they became alarmed at the difficulty of coping with such an enormous consumption; and they fortunately resolved to erect the water-gas plant. Had it not been for this auxiliary, it would have been difficult, if not impossible, for them to have coped with the increase. The transfer of the concern to the Corporation took place in 1875; and the first completed year was 1876, when the sale of gas was 2386 million cubic feet. But the district then served included Smethwick, West Bromwich, and Tipton, which had since severed their connection with the city, and which consumed 390 million cubic feet of gas. In the year ended March last, the sale amounted to 4335 millions, or nearly 2000 millions more than at the beginning. It would therefore be seen that the annual average increase in the consumption since the transfer twenty years ago had been about 4 per cent.; or, if they allowed for the gas supply to Smethwick and other places, and confined themselves to the present district, the average annual increase had been 4 per cent. compound. This year, however, it would amount to at least 12 per cent. on the already very high consumption of the previous year, or about 25 per cent. on the first output in 1876. It was evident that they would have to be ready for any reasonable emergency, and that they had not a moment to lose in the provision of further plant. There had been no extensive additions to the plant during the last twelve years. They were already badly in want of storage; and when the carburetted water-gas plant was completed, they would have to supply further means for the production of coal gas. These matters would have received their attention before, but they believed that, with the carburetted water-gas plant, they could tide over for some years. The present overwhelming demand for gas would not, however, allow them to tarry; and it would be their duty in the course of the year to mature and bring before the Council their plans for the future. They now asked simply for the duplication of the water-gas plant, for which provision had already been made. The additions required for doubling the output were not likely to exceed £43,000. Since the plant had been at work, they had produced at Saltley and Windsor Street 125 million cubic feet of carburetted water gas without the least hitch. They thought it wise to regard this as auxiliary plant, and to supply the water gas mixed with coal gas.

The motion having been seconded,

Mr. COOMBS proposed that the Gas Committee be requested to defer the duplication of the plant for a space of six months. The consumption of gas in the two weeks before Christmas should not be taken as typical; it might be some time before such an increase was again experienced. Another argument against the proposal was that the extension of the plant would be prejudicial to the introduction of a new illuminant. The explanation why the city was behind such small towns as Leamington and Worcester in the matter of illumination was consideration of the money which had been sunk in the gas-works. Birmingham would have been one of the first places to introduce the electric light if the Municipality had not owned the gas-works.

Mr. BALDEN seconded the amendment.

Mr. LANE considered that, while they must proceed cautiously with this new development of gas manufacture, they must accept the Chairman's assurance that more gas would be wanted next winter, and that the execution of the work could not be postponed. He had been very much impressed by the poorness of the gas which had reached the suburbs lately. Five years ago, he found three lights sufficient for a room in his house at Edgbaston; now with five lights, though he had adopted incandescent burners, he sometimes could scarcely see to read. When the gas was bad, there was a temptation to burn more in order to get sufficient light. If the proportion of water gas were increased, there would be an increase in the poisonous properties of the gas supplied. Therefore he thought they should not enlarge the output of water gas without also making more coal gas. The Committee had had so little experience with water gas, that it would be prudent for them to postpone any extension of its manufacture. Besides the public paid for coal gas and were entitled to it; and it was admitted that water gas was not equal in illuminating power to coal gas. He moved as an amendment—"That this Council prefers that any necessary extension of the gas-works during the present year shall consist of plant for the production of coal gas as distinguished from water gas."

This amendment was not seconded.

Mr. J. H. LLOYD pointed out that works to supply the necessary increase by means of coal gas could not be constructed in the time; whereas they were already prepared for an addition to the water-gas plant. It had been said that they were responsible to the ratepayers. But it should be remembered that they were also responsible for lighting, not only the city, but a very large district round; and they

were bound to provide for the largest possible demand. As for making the gas beforehand and storing it, the total capacity of their holders was only equal to about a day's supply. In the week ended Dec. 24, 1896, the consumption of gas was 156,500,000 cubic feet; while in the week ended Dec. 19, 1895, it was 132,402,000 cubic feet, an increase of 24,000,000 feet. If the addition were not provided at once, there was every prospect of their being without sufficient light next Christmas. It was not the Gas Committee that decided against the Corporation taking up the electric light. It was the Council on the report of a Special Committee of the General Purposes Committee; and the decision was given on general grounds, and not simply because the Corporation owned the gas-works. At any rate, there was the demand for gas, and they must supply it. As to the cost of the work, the plant for the water gas already in use was put in slightly under the estimated figures; and though the price of oil had been raised, there was no reason to anticipate any material increase in the cost of working. Taking into account the sinking fund for the capital expenditure, they could undoubtedly work more cheaply with water gas than they could with coal gas.

Alderman WHITE said that his vote would be guided by their past experience of the successful trading of the Gas Committee. The Committee had shown themselves such good judges of the requirements of the city, that he felt bound to accept their assurances. As to the quality of the gas, he had heard complaints of variations in different localities.

Alderman POLLACK, in replying on the discussion—said the use of carburetted water gas enriched the quality of the coal gas. They usually manufactured the water gas at 21 candles; but by increasing the supply of oil, they could raise it to 30 candles. As to the complaints of bad illumination, they generally ceased after a visit had been paid by the Committee's gas-fitters. The whole of the electricity supplied by the Electric Supply Company would not displace 100 million cubic feet of gas per annum; but if electricity for lighting purposes were more generally produced in private establishments, the effect on the consumption of gas would be far greater. He would not discuss the policy of the Council with regard to electric lighting. Perhaps they were unwise, as he had said before, in not taking the matter up; but if they had, the consumption of gas would have gone on increasing. The advance was no doubt very largely owing to the prosperity of the city; and there was no reason to believe that it would not continue during the present year. It was also due very largely to the greater use of gas-engines, which had become much cheaper lately, and which, in establishments where night-shifts were not worked, were the most economical motors. At any rate the increase was to be looked for; and it was one of their primary duties to be prepared for it. The water gas plant was simply an auxiliary plant; they did not look to it for their main source of supply. The maximum consumption of 167 millions in a week did not include the output at the Swan Village works, which was 18 million cubic feet. If they accepted Mr. Coombs's amendment, they would have to postpone the increase in the supply of carburetted water gas for another year at least. The Committee would have preferred to wait until they had had more experience; but they were absolutely obliged to do something. If they tried to supply the increase by means of coal gas, the necessary plant would not be ready for use for another two or three years.

The amendment was rejected without a division; and the Committee's recommendation was adopted.

CARBURETTED WATER GAS AT NEW SWINDON.

The Directors of the New Swindon Gas Company are a progressive body; and they have given evidence of their desire to keep well abreast of the times in the matter of gas supply. To cope with the increasing demands for gas, and to prevent the accumulation of a large stock of coke, they—guided by their Engineer, Mr. J. J. Jervis—decided, in the fall of last year, to enter upon the manufacture of water gas; and they forthwith contracted with the Economical Gas Apparatus Construction Company, Limited, for the installation of one of the Merrifield-Westcott-Pearson No. 1 settings, capable of producing 125,000 cubic feet per diem. The plant (which has already been completed) was erected in an existing house at the end of a bench of retorts; and the arrangement is such that room remains for duplicating the plant on both systems of manufacture. The water-gas plant consists of a generator, superheater, fixing chamber, washer, oil-heater, seal-pot, oil-pump, blower, engine, shafting, and boiler. The latter portions of the apparatus are of sufficient size for running the plant when the duplicated setting is put in. The water gas passes from the superheater, through the washer and oil-heater, to the tower scrubber, and on to the relief holder, from whence it is exhausted into a coal gas main, and mixed with coal gas, between the hydraulic main and exhauster; the two gases being purified together, and then sent on to the storage holder. It may be mentioned here that the whole of the plant and present arrangement of the works were designed and carried out by Mr. Jervis.

The inauguration of the water-gas installation took place last Thursday. The Directors met at the offices early in the afternoon, and subsequently drove in broughams to the gas-works, where they inspected the new apparatus. The simplicity of working and construction, and the freedom with which a large amount of gas could be produced by one man, were quite a revelation to some of them. At the time, 30-candle power gas was being made, in order to show what could be done in cases of emergency. The inspection completed, a return was made to the Board-room, where a collation was served; among those present at table being Messrs. Ludgate (Chairman of the Board), Wearing (Deputy-Chairman), Bywater, Hogarth, While, Watson, and Harvie (Directors), Mr. J. J. Jervis, Mr. Jervis, jun., Mr. D. P. Westcott (the Contractors' Constructing Engineer), and Mr. J. T. Westcott (the Manager of the Economical Gas Apparatus Construction Company). The Chairman, in proposing the toast of "The Prosperity of the Contracting Company," referred to the success that had so far been attained by water gas, and also to the pleasant business relations they had had with their Contractors—adding that the Directors had no complaint to make in regard to the work they had carried out for them. Mr. Westcott, in reply, congratulated the Directors upon having such an energetic Engineer, and Mr. Jervis upon having such an excellent Board to work with. He also made a brief comparison of carburetted water gas and coal gas, and mentioned the fact that the chemical compositions of the two gases were very nearly the same. After other speeches and entertaining songs, the company separated, with a parting wish that their Engineer would soon find it necessary to make another addition to the plant.

In connection with the work of the Economical Gas Apparatus Construction Company, it may be of interest to mention here that the first double superheater setting was built at Coney Island, New York, by Messrs. A. O. Grainger and Co., of Philadelphia; the Constructing Engineer being Mr. L. L. Merrifield, the Chief Engineer of the above-named Company. In 1883, Messrs. Grainger and Co. and Mr. Joseph Collins took out the first patent for this form of plant, before their consolidation with the United Gas Improvement Company, at which time only one or two of the present prominent carburetted water gas engineers were connected in any way with this form of gas making.

THE MATLOCK BATH DISTRICT COUNCIL AND THEIR GAS UNDERTAKING.

The "Assets" Difficulty—The First Month's Working.

At the Meeting of the Matlock Bath Urban District Council last Tuesday, the existing difficulty in connection with the transfer of the gas undertaking, to which reference was made in the "JOURNAL" last week, was under consideration. It has arisen upon the interpretation of section 5 of the Matlock Bath Gas Act of last year, which sets forth that, unless the context otherwise required, "the expression 'the undertaking of the Company' includes all the gas-works, engines, mains, pipes, and machinery, lands and buildings, plant, fixed and movable, stock-in-trade, gas, coal, and other stores, and all other the real and personal property, assets, and effects, of whatever nature, and all the rights, powers, and privileges vested in, or belonging to, or had or enjoyed by, the Company at the date of the transfer of the undertaking of the Company to the Council under the provisions of this Act, except the books and papers relating exclusively to the shareholders in, and the constitution of, the Company." It will be remembered that Mr. Cozens-Hardy, Q.C., has been advising the Council in this matter; and he has given an opinion to the effect that, upon the payment of the gross sum named in the award, all the property of the Company—including, *inter alia*, "the stock-in-trade, balance in bank, cash in office, office furniture, and outstanding sums due from customers"—vested in the Council; and he advised them to steadily maintain their position as "absolute assignees of all the property of the Company, except books and papers," the exception of which in the above-named section, he said, strongly showed "the generality of the undertaking." The subject came before the Council on a report presented by the Parliamentary and Negotiation Committee, who thought it was perfectly clear that the Council should collect all the gas accounts forthwith; but as the Gas Company continued to hold the books and papers relating to the working of the undertakings, and as these included the register of the gas-meters at the end of the September quarter, they said it was impossible for them to make out the accounts for the quarter ended Dec. 31, 1896. The Arbitrator (Sir W. Coddington, M.P.) was consulted on the matter by the Gas Company; and he replied as follows: "My award was for the works, mains, and all other articles for the manufacture of gas, and did not include coal in stock, gas in gasometer, book debts, bank balance, or any other moneys due to the Company on the 31st of December last. All these should be taken and paid for by the District Council at the market value." He also wrote to the Clerk to the Council to the effect that he felt sure they would see the justice of paying the Company in accordance with his letter. The Committee submitted the correspondence to Mr. Cozens-Hardy, for his opinion thereon; but this had not been received when their report was made. The Chairman of the Council had also had an interview with the Arbitrator. In the meantime, the Council were compelled to carry into effect the provisions of the Act; and therefore they required that all the books and documents (other than those relating to the shareholders and the constitution of the Company) should be immediately handed over, so that they might collect the gas accounts and assets without further delay. With regard to the assets transferred, the Committee felt that as the Arbitrator had definitely stated that he did not include in his award any sum for them, the Council should pay such amount as the Arbitrator might consider right. The Committee expressed the hope that the legal difficulty could be legally removed, as they were united in the opinion that the Council was morally bound to pay the Company an additional sum for the assets falling into the possession of the ratepayers by the operation of the section in question. On the motion for the adoption of the report all the members voted for it except two—Mr. D. P. Pearson and Mr. Lennox. When the vote to the contrary was taken, the latter gentleman did not vote. He remarked, however, that, if the Arbitrator had stated that his award was for the whole concern, there would have been an end of the matter. Mr. L. Pearson said the Arbitrator's award and his letter were two different things. Mr. Lennox asked if the Council were aware that the book debts were overlooked during the arbitration, as this was important. Mr. L. Pearson said they were in evidence. The subject then dropped.

The Gas Committee on the same occasion reported that they had had a meeting on the previous Saturday at the gas-works, when the General Manager (Mr. W. Jaffrey) presented his first monthly report. After thanking the Committee and the Council for the confidence they had shown in him by placing in his hands the management of the gas-works, he stated that their general condition was in many respects far from satisfactory. The plant had, however, been overhauled and greatly improved, and various appliances had been purchased. Details having been given, Mr. Jaffrey went on to specify the work which was urgently required to be done. This included 13 new retorts, the enlargement of the furnace chamber of the regenerator settings, new

sheeting to one of the gasholders, and three district governors. With regard to the working, he reported that the gas made in 29 days was 1,532,000 cubic feet; consumed, 1,530,000 cubic feet; in stock, 40,000 cubic feet. The quantity of gas made per ton of coal carbonized was 9820 cubic feet; and the illuminating power was 19 candles. The coke made, calculated at 12 cwt. per ton of coal carbonized, was 93 tons; sold, 38 tons; in stock, 12 tons; used, 43 tons. The quantity of ammoniacal liquor sold was 8¼ tons. He concluded by submitting estimates for new mains which might be required. The Committee stated that they had resolved to carry out the works regarded as urgent, and to put down certain new mains. Mr. L. Pearson (the Chairman of the Committee) having moved the adoption of the report, Mr. Lennox asked what the new retorts were for. The General Manager said they were to replace others worn out. Mr. Lennox went on to object to the proposed new mains. The report was, however, adopted; the only dissentients being Messrs. Lennox and D. P. Pearson.

ELECTRIC LIGHTING NOTES.

The St. Pancras Vestry on Wednesday made another step towards achieving popularity by abolishing, without discussion, all charges for fixing electric meters except automatic slot meters. A very elaborate "application form" and "terms and conditions of supply" were submitted to the Vestry, and ultimately approved. It is instructive to note that the latter include a clause suggesting what should be done "in case of any interruption of the supply." Users of the day supply of current are informed in this document that "the Vestry are at liberty to switch off the current each day at any time upon notice being given to the applicant that the current is required by the Vestry's ordinary consumers for lighting purposes." One can easily imagine the unfortunate manufacturers turning again to the reliable gas-engine, which is not liable to be switched off each day at any time. Later in the debate Mr. Cox, the Chairman of the Electric Lighting Committee, asked for more money—this time for extra boilers. It appears that at the King's Road station, "instead of the boiler power being in excess of the engine power, the reverse is the case;" and the Committee therefore recommended that two more boilers, with accessories, should be ordered forthwith at an estimated cost of £2250. This was agreed to. The Committee also recommended that mains be laid in a certain thoroughfare, "in view of the present demand and further applications that are shortly anticipated," at a cost of £224. Mr. Barnes thought the reasons given were very vague. No figures were vouchsafed; while the houses to be supplied were private residences on short leases. In his opinion, these constant extensions constituted a serious matter; and he urged the Vestry to be cautious, and see beforehand whether they could be made profitable. Mr. Cox, in reply, said seven applications had been received, and these would produce 20 per cent. of the outlay per annum. The Committee never recommended an extension unless such a proportionate return was practically guaranteed. Mr. Barnes thereupon subsided.

In no way daunted by the admitted failure of the arc lamps in the Finchley Road, the Hampstead Vestry last Thursday embarked on another similar venture by confirming the recommendation of their Electric Lighting Committee to also light the High Street and Haverstock Hill. The opposition, however, had succeeded in forcing the Committee to submit full details of the scheme, which includes the erection of 28 Crompton-Pochin lamps, the provision of a Siemens dynamo and various fittings, and the extension of the lighting to the St. Pancras boundary, where that parish's system will form (when completed) a continuous line of arcs for about four miles. The lamps and posts are estimated to cost £484; the mains, £286; and the engine, dynamo, &c., £715. Mr. M'Millan moved an amendment to delay the work for the present; and Mr. Richardson characterized the extension as simply a waste of money. But their endeavours were all to no purpose. The Vestry were tired of the whole question; and, without further debate, authorized the work. For the sake of the residents in this main thoroughfare, and the reputation of the Vestry, everyone must wish this venture better success than has hitherto attended the lighting in the Finchley Road.

The Gas Committee of the Rochdale Town Council have appointed a Sub-Committee to inquire concerning electric lighting by municipal authorities, with a view to enable them to decide as to the desirability or otherwise of recommending the Council to apply for electric lighting powers.

At the meeting of the Brighton Town Council last Thursday, it was resolved to reduce the price of electricity to 7d. per unit for the first hour, and 1½d. per unit afterwards. It is claimed that this is the lowest rate of supply in England.

The electric light plays the same tricks at Cape Town as it is wont to do elsewhere. A bitter complaint appeared in the local papers the other day because the light failed, and left the town in darkness, on New Year's Eve—one of the busiest evenings in the year, and with more than the usual amount of traffic in the streets. Another failure occurred on the night of the 6th ult., when, according to the "Cape Argus," St. George's Street was "given over to lurchers of the worst sort, who found darkness preferable to light. In Adderley Street, shortly before eleven, the only glimmer of light came from the cab-lamps." Our contemporary adds that "the streets have on several recent occasions been worse than in the old days of gas-lamps." This seems pretty obvious, for the gas at all events did not go out, and leave the matter of street illumination to the glimmer from a few cab-lamps. The "Argus" further suggests that something should be done to prevent so frequent a recurrence of the nuisance—which also is obvious. On the other hand, it is only right that credit should be given to the electricians of Cape Town for a recent smart piece of work. One of the features of the demonstration on the return of Mr. Cecil Rhodes to the capital of the Colony was a triumphal arch lighted by electricity. The installation, which consisted of nearly 200 lamps, involving about 1000 joints and connections, was commenced on the day before the reception, and finished in time. It is to the credit of the people who did the work that, in spite of its hurried character and a strong north-east wind which was blowing, not one of the lights failed.

THE LONDON COUNTY COUNCIL AND THE WATER QUESTION.

The Council and the Outside Authorities.

At the Meeting of the London County Council last Tuesday—Sir A Arnold in the chair—the Parliamentary Committee reported that, in accordance with the resolution of the Council on the 10th of November last, they had been engaged in discussing terms of agreement with the authorities outside the County of London, but within the area of the Water Companies, and had made very considerable progress. The questions remaining to be settled were (with one exception) rather matters of detail than of principle. They now presented two agreements to the Council. One was arrived at with the County Council of Surrey in 1895, and the terms of a clause for insertion in the Lambeth (Transfer) Bill were also settled with the Corporation of Croydon. The Committee had carefully reconsidered these agreements, with the assistance of the officers of the Council. They had also taken the most competent independent advice, and were advised that these agreements afforded a fair settlement as between the interests of the respective authorities, and were advantageous to the County of London. They therefore recommended—"That the agreement with the County Council of Surrey be approved and sealed; that subject to the approval of Parliament, such clauses as may be necessary to give effect thereto be inserted in the Bills relating to the Lambeth and Southwark and Vauxhall Water Companies; and that the clause arranged with the Corporation of Croydon be approved, and, subject to the approval of Parliament, be inserted in the Bill relating to the Lambeth Company."

Dr. White moved, as an amendment, that the matter should be referred back in order that the Council might have before them a report on the results of the negotiations with the representatives of the other County Councils and boroughs concerned, prior to arriving at a final conclusion on the proposed agreements with the County Council of Surrey and the Corporation of Croydon.

Mr. H. P. Harris seconded the amendment, and pointed out that the policy of severance was one which would plunge the Council into heavy expense, inasmuch as there were no fewer than eight arbitrations provided for in the two agreements before the Council.

Lord Onslow thought the Council had not considered fully the effect of the proposed agreements. Was it, he asked, in the interests of the ratepayers of London that the Council should saddle the purchase of the water undertakings with agreements to sell off a very large portion of the rights acquired? How could the Council decide as to the quantity of water to be taken from the Thames by Surrey until they knew how much would be required by other authorities, or how much Hertfordshire would demand to take from the Lea? The proposal meant a leap in the dark, of a very perilous character.

Mr. M'Kinnon Wood, the Chairman of the Committee, said their scheme was to give to the authorities of the outside areas the same rights as were claimed for the County of London. The question had been before the various authorities for many years; and it was with the experience of these years that the Committee had come to the conclusion that there was no other scheme for dealing with the water question which would command the assent of the Greater London authorities. The outside authorities would neither consent to the dominance of London nor to the control of a Water Board. The only practical policy was that which was now being pursued by the Committee, whereby the Council sold to the outside authorities their portion of the water undertakings.

Sir J. Lubbock, Bart., M.P., feared the Council would have great difficulty in drawing the dividing-lines between the various districts, and anticipated that the cost would be extremely heavy. He thought the matter should receive more consideration; and he favoured a reference back.

Mr. W. H. Dickinson, the Chairman of the Water Committee, asked the Council to consider whether they would throw out these agreements with the view of enabling the Government to reject the Council's Water Bills on the second reading. They had agreed to sell on the basis of population, because this was the most favourable basis for London. Had they taken the basis of rateable value, the result would have been very different. Between London and outside, the water was not a heritage, but a loss. The Companies spent 5s. and received 4s. outside the Metropolitan area. Surrey would have to pay her proportion of the cost of purchase, or she would have to accept water from the County of London; and the Council, under these circumstances, would be perfectly justified in charging Surrey a price which would ensure them a profit on their expenditure. The arrangement with Croydon was, he held, very favourable to the Council.

The Deputy-Chairman (Mr. Beachcroft) said that, though Surrey, Croydon, Essex, and West Ham were mentioned, nothing was said about Middlesex. A great deal had been heard about the Council, but too little about the water consumer, whose interests were at stake. He disapproved of the agreements proposed by the Parliamentary Committee. The Council had no business to accept them simply to assure the second reading of their own Water Bills; and he thought the Council should have the terms before them in order that they might judge whether they were fair and just.

On a division, the amendment was carried by 53 votes to 51.

Increase in the Price of Gas at Ellesmere.—The Ellesmere District Council have decided to raise the price of gas from 4s. 6d. to 5s. 6d. per 1000 cubic feet, as from March 25 next.

Sales of Shares.—The following shares have recently been sold by auction: 108 £10 shares in the Folkestone Gas Company, consisting of 29 original shares, paying 10 per cent., and 79 new shares, paying 7 per cent., realized from £24 10s. to £24 15s. for the former, and from £17 5s. to £17 15s. for the latter. A parcel of eleven fully-paid £10 shares in the Folkestone Water Company secured the high price of £27 12s. 6d. each. A parcel of fully-paid £25 shares in the Bradford-on-Avon Gas Company fetched £40 per share; similar shares with £8 paid being knocked down at £15 5s. each. At Camborne, on the 28th ult., ten £5 shares in the Camborne Gas Company were sold by auction at par.

NOTES FROM SCOTLAND.

From Our Own Correspondent.

Saturday.

No further progress has been made in the matter of the filling up of the Edinburgh vacancy; but it must not be supposed that the Committee have been idle. This may be said to have been a week of proving the selected candidates. The Committee will meet, probably on Monday; and it is the intention to reduce the short leet to two, or perhaps three, and then the names of those in the final list will be submitted to the Commissioners.

The Dumfries Town Council, on Thursday, had before them a report by the Gas Manager (Mr. G. Malam) on the proposed extensions of the works. Mr. Malam recommended the building of four ovens, at a cost, including retorts and ironwork, of £1388; three ovens without retorts or ironwork, at £200; the laying of new mains, at £1000; and the sinking of an artesian well, at £350—a total expenditure of £2938. The Gas Committee recommended the adoption of the report. Bailie Currie, in proposing the adoption of the recommendation, said that the consumption of gas had gone up to such an enormous extent that the Manager felt he could not be responsible for giving an adequate supply unless he got new retorts; and there were complaints as to the size of the mains—especially on the Maxwelltown side. The artesian well had been bored to a depth of 385 feet, at a cost of £253; and the yield of water from it was now 8640 gallons per 24 hours. The mains which it was intended to lay would be, in one thoroughfare, a 12-inch for a 7-inch; and in other thoroughfares a 12-inch for a 6-inch main, a 10-inch for a 7-inch, and a 9-inch for a 6-inch. Dean Hiddleston, who seconded, said that in these works they were only doing what was an absolute necessity. On one dark day recently, the consumption of gas in the town was 60,000 cubic feet more than the Manager could make at the works; and if the darkness had lasted for two or three days, they must of necessity have been put upon short supply. The expenditure upon the new works would be met, as usual, out of revenue; and in consequence of the expiry of a loan next year and the arrangements for a new one, they expected to be able to go on without increasing the price of gas. The proposals were agreed to. When Mr. Malam has the improvements carried out, he will be in possession of a very well equipped works, and be able to bid good-bye to some of his recent troubles for, it is to be hoped, many years to come.

The proposal has been revived in the Motherwell Police Commission that the Corporation should make an effort to acquire the undertaking of the Motherwell Gas Company. The subject had been before the Water and Lighting Committee; and they, on Tuesday, recommended that the Gas Company should be written to, inquiring if they were prepared to treat privately for the sale or transfer of their undertaking to the Commissioners. Bailie Findlay, who submitted the recommendation of the Committee, said they thought it desirable to ascertain the mind of the Gas Company on the matter; it being the general opinion that gas-works should be the property of corporations. The only question was whether they could be had on suitable terms. Five years ago, they were in correspondence with the Company on the same subject. They then wished the Company to make an offer, but the Company wanted the Corporation to do so; and the matter was allowed to drop. The report was adopted.

In Stirling, it appears, there have been rumours regarding meetings between the Directors of the Gas Company and the Gas Committee of the Police Commission. It is pointed out, however, that after the decision of the shareholders of the Gas Company proposing a new basis of negotiation, nothing can be done by the Committee except to report to the Police Commission. This information is given for the benefit of those in the community who are afraid that the transfer of the gas undertaking may be sprung upon them. There is not much fear of this; but it is satisfactory to know that efforts are still being made to bring the parties together.

In the Arbroath Gas Corporation, on Monday, a suggestion was made that in future the meetings of the Committee of the Corporation should be held in public. Mr. Lorimer, who made the proposal, gave the reason for it to be that as all the members of the Corporation are members of the Committee, and the Committee usually meet just before the meetings of the Corporation, members are either obliged to redeliver their speeches or to transact their business without giving any reasons; and he thought the public would like to know why certain things were done. If the Corporation desired any particular item kept private, he had no doubt their wish would be given effect to. Provost Grant seconded the proposal, which was agreed to unanimously. It was reported that a draft of the clause in the new Harbour Bill, with reference to the liability of the Corporation to contribute £250 a year towards the redemption of the debt on the harbour, had been received; but that the clause did not limit the contribution to £250. The effect of this would be that if there were a surplus exceeding £250, the excess would also go to the harbour. At present, the town gets half of the gas profits; and it was the understanding of some that, after giving £250 to the harbour, if there were further profits, the present arrangement should continue, and the town would get half. Provost Grant's opinion, however—and it was the view which was adopted—was that the Bill would abolish altogether the existing arrangement; and that, when the Gas Corporation gave the £250, any further profits would belong to themselves, to be used for the reduction of the price of gas. It was agreed to have the clause amended so that the total liability to the town and harbour should not exceed £250. This sum, I should say, is quite large enough a slice to take out of the revenue of the Gas Corporation.

In Dunfermline, on Monday forenoon, workmen were laying a new main; and they had cut, and stopped in the usual way, an old 3-inch main. As is quite common, the stopping had not been particularly tight, with the consequence that considerable leakage occurred; and unfortunately this escaped gas was ignited by a spark from a chisel. The stopper was blown out; and the flame was for a few minutes quite alarming, rising, according to an estimate I have seen, to a height of about 20 feet. The workmen were equal to the occasion. Sand had not much effect in extinguishing the flame; but clay was made of the soil, and by means of it the fire was easily put out. One of the workmen was burned about the face.

A curious action was decided in Dunfermline Small Debt Court yesterday. On Oct. 23 last, a couple of miners were seated in a public house in Cowdenbeath, when an explosion took place, by which some bricks of a partition between two rooms were thrown down. Some pieces of plaster struck one of the miners, injuring him; and his clothes were destroyed by dust. He sued the keeper of the house for £12. The averment was that the explosion was caused by gas, and that the publican was responsible for the condition of the gas supply. The defence was that the explosion was caused by dynamite, which had been brought into the house by a fellow customer. The Sheriff ruled that it was a gas explosion, most probably caused by the gas not having been properly turned off in the adjoining room. A gas explosion presumed carelessness, and threw upon the defender the onus of proving that she took reasonable care to protect from accident customers whom she invited into her house. He gave decree for £5, with £4 expenses.

Mr. Newington, the Electrical Engineer to the Corporation of Edinburgh, and his staff are busy altering consumers' lamps and fittings, so as to facilitate the change of voltage from 115 to 230. An appeal is made to consumers to co-operate, with a view to having the whole low-tension system made 230 volts before the end of next summer.

At a meeting of the Glasgow Corporation on Thursday, it was reported that the illumination of St. Andrew's Hall by arc lamps was to be changed. It was not stated what the new form of lighting was to be; but it is expected it will be by incandescent electric lamps.

On Monday, a new water supply for the burgh of Troon and the surrounding district, was turned on by Mr. M. Bain, J.P. The water is derived from the Dundonald Hills—an area of 88 acres of which has been drained into a reservoir, constructed to hold 48 million gallons of water, about 2½ miles from Troon. The supply will be equal to 240,000 gallons per day for 200 days. Though the water has been turned on now, there is to be a formal inauguration of the works by the Duke and Duchess of Portland in May next.

An incident which might have proved to have been an awkward one, was reported to the Works Committee of the Edinburgh and District Water Trust yesterday. One of the sluices at Glencorse reservoir during the past week got out of repair—due, it is supposed, to the action of blocks of ice. The sluice is 16 feet from the top level; and the water ran down the Glencorse Burn until it reached the level of the sluice. The damage was being repaired; it being probable that the work would be completed that day. The loss of water caused by the mishap was about 177 million gallons, or one-half of the total capacity of the reservoir; but fortunately there is plenty of snow on the hills, and this, when melted, will go a long way to restore the supply which has been lost. In addition to this occurrence, the main-pipe from Gladhouse burst about two miles beyond Straiton; and the water had to be shut off for a couple of days. The pipe was repaired at an early hour yesterday; and the supply of water was restored. The reservoirs of the Trust, with the exception of Glencorse, are all full; and the works at Alnwick Hill for renewing the filter-beds are progressing satisfactorily.

CURRENT SALES OF GAS PRODUCTS.

LIVERPOOL, *Feb.* 6.

Sulphate of Ammonia.—There has been a fair demand throughout the week, but scarcely sufficient to sustain prices; the closing quotations being £7 15s. f.o.b. Leith, £7 16s. 3d. Hull, and £7 16s. 3d. to £7 17s. 6d. Liverpool. The very severe weather experienced during the past weeks has retarded business—precluding, as it has done, agricultural operations, and seriously interfering with inland transit on the Continent. Consumers have been in no hurry to cover their further requirements, notwithstanding the inducement of reduced prices; and their action in the coming weeks will no doubt be largely guided by the weather. Dealers have been availing themselves of the quiet market for "covering" their sales; and the buying has been done mainly by them. At the same time, they are offering, on the Continent, February-March delivery at spot prices, and February at even below spot quotations. There have been resales on the Continent; but speculators are, for the most part, responsible for the low prices quoted abroad. Further ahead, there are sellers at a small premium; and the fact that London, Beckton terms, May-August, is quoted £7 17s. 6d. lends encouragement to "bear" operations, where practicable. Consumers are, however, shy of forward business; their experiences of the past two seasons having been unfortunate.

Nitrate of Soda is steady, but very quiet on spot; consumers not having commenced to buy seriously. The quotations are 8s. 1½d. per cwt. for good, and 8s. 3d. for fine quality. Heavy arrivals at port of call damped the cargo market for a short time; but the cargoes having been disposed of at 8s. 1½d. to 8s. 3d. per cwt., a better tone prevails at the close.

LONDON, *Feb.* 6.

Tar Products.—A dull market has characterized the week; and distillers are a little alarmed at the drop in the prices of some of the principal products—notably pitch and anthracene. The published report of The Gaslight and Coke Company shows the realized value of products from a ton of tar to be about 1½d. per gallon, notwithstanding their admirable plant and opportunities of selling; while distillers, in some instances, are paying as high as 2d. per gallon, and have on the top of this to pay cost of carriage to their works, and expense of distillation and refining. The position is anomalous, and is provoking a good deal of comment. Exceptional causes, however, affect particular contracts, and may account for prices being paid for the raw material which are actually in excess of the aggregate value of the finished products, after adding carriage and cost of manipulation. It is now recognized that tar must be cheaper, as will be seen by the quotation below.

Prices obtaining during the week are: Tar, 16s. to 22s. 6d. Pitch, 22s. to 24s. Benzols, 90's, nominal, 3s. to 3s. 3d.; 50's, 2s. 9d. Solvent naphtha, 1s. 6d. Crude, 30 per cent., naphtha, 1s. 1½d. Creosote, 1½d.; liquid, 1⅜d. Heavy oils, 35s. Naphthalene, 65s.; drained salts, 30s. Carbolic acid, 60's, 1s. 11d. Anthracene, "A," 8d. to 9d.; "B," 7⅞d.

Sulphate of Ammonia.—This market is still in a dragging and uninteresting position. Although shipments are very much improved, there is no change in value, which runs from £7 15s. northern ports; £7 16s. 3d. north-eastern ports; £7 17s. 6d. western ports; £7 17s. 6d. southern ports—all less 3½ per cent.

COAL TRADE REPORTS.

From Our Own Correspondents.

Lancashire Coal Trade.—The coal trade here shows no material change; a fairly good demand being reported generally, with pits kept going full time. Steam and forge coals meet with a steady demand; the present output being disposed of without difficulty, while there is a firm tone at recent quotations. At the pit mouth, best Wigan Arley remains at 10s. 6d. to 11s. per ton; Pemberton four-feet and seconds Arley, at 8s. 6d. to 9s.; and steam and forge coals, at 6s. 6d. to 7s. in some special cases. With the present activity in the round coal trade, there are necessarily plentiful supplies of engine fuel offering; and to effect clearances, there is here and there a temporary giving way on current rates. The generally quoted prices, however, are without alteration, and for forward contracts are firmly held to. Common slack averages about 3s. to 3s. 6d. per ton at the pit; medium sorts, 3s. 9d. to 4s. 3d.; best slack, 4s. 6d. to 4s. 9d., with some special sorts fetching 5s. A steady business comes forward in the shipping trade, with prices at about 7s. 9d. to 8s. for good steam coal, though 7s. 6d. would be taken for some sorts; while better qualities are, in special cases, fetching 8s. 6d. per ton, delivered at ports on the Mersey.

Northern Coal Trade.—The coal trade has been more active, and the shipments larger, more especially of gas coals. Best Northumbrian steam coals are in fair demand; and for immediate delivery, the quotation is 7s. 10½d. to 8s. per ton f.o.b., while for delivery over the season the quotation is from 8s. 9d. to 9s. per ton. Second-class coals are about 7s. 6d. per ton f.o.b. prompt; and steam smalls, 3s. per ton. Manufacturing coals are also fairly firm; and the demand seems slightly increased. In the gas coal trade, there is a very strong demand; and a pressure for shipment has been felt. At present, the exports of gas coals are limited; but tendering for the annual contracts for foreign gas companies will commence in a fortnight or so. Very little gas coal is being sold just now; but for what is being disposed of above the quantities contracted for, about 7s. 6d. per ton f.o.b. is the medium quotation. There is no change in the price of gas coke this week; but the production is now beginning to show signs of decrease, and the stocks are also likely to fall soon.

Scotch Coal Trade.—There is still a very healthy tone; and there are expectations of trade continuing to improve during the spring—especially the shipping trade. A feature which has been wanting for months in the market, is the large amount of inquiry for forward delivery. In conjunction with this, there is also the fact that coal-owners are disinclined to enter into large contracts except at a considerable advance on existing prices. Ell is having a ready sale. Splint is moving off freely, but is more abundant than for two months. Main remains unchanged. The prices quoted are: Main, 6s. 9d. per ton f.o.b. Glasgow; ell, 7s. to 7s. 3d.; and splint, 7s. 6d. The shipments for the week amounted to 120,469 tons—a decrease of 21,398 tons as compared with the preceding week, and of 3591 tons on the corresponding week of last year. For the year to date, the total shipments have amounted to 510,131 tons—an increase over the same period of last year of 3852 tons.

Reductions in Price.—The Directors of the Elland-cum-Greetland Gas Company have decided to reduce the price of gas, as from the 1st of July next, to 2s. 6d. per 1000 cubic feet, subject to the usual discounts of 2½ to 15 per cent.; thus making the net prices 2s. 1½d., 2s. 3d., and 2s. 6d., according to consumption. The Directors of the Northampton Gas Company have decided to reduce the price of gas in the outlying districts to the same figure as is charged in the borough; also, as to future accounts for gas in all districts, to increase the discount allowed for prompt payment from 7½ to 10 per cent. The Romford Gas Company have reduced the price of gas by 3d. per 1000 cubic feet. It will now be 2s. 9d. in the district lying within a mile of the works, and 4s. 1d. beyond this radius. The Town Council of Kilmarnock have announced that the price of gas will be reduced from 3s. 1½d. to 2s. 8½d. per 1000 cubic feet as from the 1st prox.

The Management of the Nelson Corporation Gas Undertaking.—At the monthly meeting of the Nelson Town Council last Thursday, a resolution passed by the Gas Committee to increase the salary of the Gas Engineer and Manager (Mr. W. Foster) by £50 per annum, was submitted by Alderman Wilkinson, the Chairman of the Committee. He explained that it was seven years since the Gas Manager had had an increase of salary. Since he was appointed, the gas-works had doubled their production. The Corporation had spent £60,000 on the extensions, and if they had paid for special assistance, as was frequently (if not generally) done, it would have cost them at least £2000. But their Manager had done the work himself without any special assistance; and, under all the circumstances of the case, the Committee were quite unanimous in voting for the advance, as they felt he quite deserved it. In reply to a question by a councillor, he explained that the salary included gas and coal for the Manager's house, by providing which they secured the advantage of having him resident upon the works. The resolution was unanimously confirmed.

Birmingham Corporation Gas-Fitters' Benevolent Fund.—The workmen employed in the gas-fitting department of the Birmingham Corporation held their annual dinner last week in connection with the Gas-Fitters' and Meter Inspectors' Benevolent Fund, started two years ago. Mr. S. R. Barrett (the President of the fund), in proposing its success, stated that, by means of 1d. a week subscription, the staff of 200 men had during the past year raised £109. The fund was used to assist members when in distress through illness or other causes. It was managed by the men, and had been of great advantage to them—having displaced the obnoxious system of "sending round the hat;" and it sufficed not only to relieve all cases of distress, but to provide the staff with their summer outing and annual dinner. Tickets were purchased for the Sanatorium and other institutions; and the sum of ten guineas was voted to the Hospital Saturday Fund. The Chairman (Mr. Berkeley), in responding for "The Gas Committee," congratulated the staff on the formation of the fund, which had, he said, not only been a direct benefit, but had promoted an excellent *esprit de corps*, and had tended to a better understanding between the workmen and the officials.

Increased Gas Consumption at West Bromwich.—During the nine months ending December 31 last, the sale of gas at West Bromwich, compared with the corresponding period of 1895, showed an increase of 12 million cubic feet, which is equal to nearly 8 per cent.

New Water-Works at Cranbrook.—The Cranbrook District Water Company have for some time been endeavouring to acquire land at Cranbrook, Hawkhurst, or Goudhurst, on which to construct a new reservoir and sink wells. They have now been successful in obtaining a suitable site in the Weald of Kent; the position being nearly 450 feet above sea-level. The sinking of the first well has been commenced.

The Assessment of the Lancaster Gas-Works and Mains.—With reference to the appeal which the Lancaster Corporation, on the recommendation of the Gas Committee, had resolved to make against the rating of the gas-works and mains, as notified in the "JOURNAL" for Sept. 29 last, we learn that the Mayor (Mr. Helme), the Town Clerk, the Gas Engineer (Mr. C. Armitage), and Mr. Thomas Newbigging have recently appeared before the Assessment Committee in regard to the matter, with the result that the rates are to be paid on the 1892 valuation pending a re-valuation on the completion of the annual accounts to March 31 next, when the matter will be adjusted.

Shocking Gas Suffocation Accident at Drogheda.—An extensive leakage of gas from a main into a lodging-house was responsible for a distressing occurrence at Drogheda on Sunday last week. According to one account which has been received, it appears that a man, who had been locked up for drunkenness, returned to the house in the morning, and was unable to rouse the inmates. After a time, the police entered the premises, and found an overwhelming smell of gas. Two lodgers named Slevin and Cranny were discovered dead in bed; and three others, as well as the landlord and his wife, were found in bed unconscious. These five persons were taken to the hospital, and at length restored to consciousness. Gas was not used in the house; and the leakage had been caused, it is supposed, by a passing traction-engine.

Dinner of Gas Workers at Doncaster.—On Tuesday, the 26th ult., the workmen employed at the gas-works of the Doncaster Corporation dined together at the Stag Inn, in the town. The Gas Engineer and Manager (Mr. Robert Bridge) presided over a large muster; and a most enjoyable evening was spent. In the course of the proceedings, Mr. W. Mort proposed the health of Mr. Bridge; and the toast was very cordially received. In replying, Mr. Bridge referred to the twenty years he had been Manager of the works, and expressed the pleasure he experienced in seeing a number of the old workmen around him. He congratulated them on the position they held that day. The works had always been advancing; and whereas twenty years ago they made 54 million cubic feet of gas in the year, in the quarter ending December last they made 52½ millions. During the time they had worked together there had been no hitch between them; and while in other towns there had been strikes and disputes among the stokers, there had been nothing of the kind—be it said to their everlasting credit—at the Doncaster Gas-Works. He advised them to study their interests by working harmoniously together; and if there was anything they wanted righting, he asked them to come to him, and he would try to meet them in a friendly spirit. He was glad to see so fine a gathering of men; and he hoped they would have many future meetings of the kind.

The Leeds Gas Workers' Dispute to be Submitted to Arbitration.—The pending dispute between the Leeds Corporation Gas Committee and their men concerning two foremen in the pipe-laying department is to be submitted to arbitration. The men state that they still believe a majority of the Committee have acted in a very unjustifiable manner; but they agree to arbitration, "seeing what a serious calamity it would be to the ratepayers of Leeds if a general strike were engaged in." An announcement, at last Wednesday's meeting of the City Council, of the decision to refer the questions at issue to arbitration, brought from Mr. Henry an inquiry as to whether the Committee had considered the points about which they were going to arbitrate. The incompetence of a workman, he pointed out, was a difficult thing about which to arbitrate. If a manager considered he had an incompetent workman, and the matter had to be referred to arbitration, the whole question of discipline would be seriously affected. He asked the Gas Committee to be cautious; for such a question would have influence upon more departments than the one concerned in this instance. It was a matter more for management than arbitration. There was not a member of the Council, or a single employer in the city, who would delegate to any one outside his business his own judgment as to whether a man was competent or incompetent. The subject was not further discussed; Alderman Walker having intimated that he thought it well that the portion of the minutes bearing upon the point should be simply adopted.

Distressing Gas Explosion at Norwich.—Last Wednesday, Palace Street, Norwich, was the scene of an extraordinary accident, which was attended by distressing results. On Tuesday evening, John Leverett, residing at No. 27, noticed a smell of gas in the house, but could not ascertain its origin, as gas was not laid on to the premises. He and his wife accordingly determined to pass the night in a neighbour's house, and asked his aunt Eliza Buttwell, aged 70, to accompany them. She however declined; and next morning Leverett discovered her lying at the bottom of the stairs with a large wound in her left temple. She was conveyed to the hospital, where the house-surgeon stated that she was suffering more from a fall downstairs than from the effects of gas. Information as to the escape having been conveyed to the gas-works, a gang of men at once proceeded to lay bare the main, which runs down by the side of the house. It was found that the pipe was broken, and that the gas had percolated the soft ground where an old building had stood, and so obtained entrance underneath the floor of the house. The men removed the broken pipe and put in a new length. Just as they had completed their work, and before they had put back the soil, a loud explosion was heard inside the house. The men at once rushed in, and there found Mrs. Leverett and her little girl (who had returned shortly before) terribly injured, and the room completely shattered. The unfortunate persons were removed to the hospital, where it was found that Mrs. Leverett was suffering from a broken leg, and that both legs of the child were fractured. The latest report states that Mrs. Buttwell and the child are dangerously ill, and the mother of the latter is progressing favourably.

Explosions in Electric Light Culverts in Brussels.—According to the Brussels Correspondent of the "Daily Chronicle," a series of formidable explosions occurred in the city on Monday night last week, in connection with the underground electric lighting installation, between the Grand' Place, in the neighbourhood of the Hôtel de Ville, and the Palais de Justice—a distance of more than half a mile. He says that in several portions of the route, the roadway was torn up, and fragments of the *débris* were projected a considerable distance. By extraordinary good fortune, no fatalities occurred. The accident is traced to an escape of gas from an adjoining pipe into the transformer chambers, cases of which have occurred in London.

The Water Supply of Northam and Appledore.—There is no prospect of an end being put to the protracted controversy over the water supply of the district governed by the Northam District Council. Having failed to agree upon a scheme, the Council called a parish meeting, at which the Rev. Prebendary Dimond-Churchward presided. He expressed the opinion that the scheme prepared by Mr. Baldwin Latham, M.Inst.C.E., for obtaining water from Abbotsham, was too expensive, and that the Local Government Board would not sanction either the Pimpley or the Cleave schemes, which had been considered by the Council. Mr. G. O. Peard strongly advocated the adoption of Mr. Baldwin Latham's modified scheme; and he moved a resolution in its favour. Dr. Hemmings, who described Mr. Latham's scheme as ridiculous, proposed as an amendment that borings should be taken at various points, with a view to the adoption of sectional schemes. The amendment was carried by a large majority.

The Hertfordshire County Council and the London Water Bills.—The Parliamentary Committee of the Hertfordshire County Council have drawn up a report dealing with the various Bills which are about to come before Parliament in respect of water supply. The report states that in 1896 the Council spent £4891 12s. 8d. in opposing the Bills of the New River and Southwark and Vauxhall Water Companies, and the Staines Reservoirs Bill. The Committee are glad to find that the costs of the opposition to these Bills fall within the sum of £5000 allowed. They recommend that opposition shall be given to the following Bills of the present session: The New River Bill, East London Water Bill, New River Water (Purchase) Bill, and East London Water (Purchase) Bill. The County Council have empowered the Committee to take the necessary steps to oppose these Bills, if they should find it desirable to do so. They have also passed a resolution directing their Clerk to inform the President of the Local Government Board that the Council are in favour of the Metropolitan Counties Water Board Bill, as passed by the House of Lords in the last session of Parliament, being proceeded with, subject to possible amendments in detail. The Council desired, however, to impress upon the President the necessity of a clause being introduced providing that, any assumed common law right to the contrary notwithstanding, no person, company, or corporation should be allowed to sink new wells, or enlarge existing wells, on their property, for the purpose of supplying the Metropolitan area with water, nor to supply the water pumped from such wells either directly or indirectly to that area, without the express sanction of Parliament.

Gas and Electric Lighting in Georgetown.—Mr. Daniel Barker, of Stirling, who is on a visit to Demerara, has sent a letter to a fellow townsman, in the course of which he refers to the position of gas and electric lighting in Georgetown. He writes: "I have had a long talk this morning (the 21st ult.) with the Manager of the Electric Lighting Company here in Georgetown. You know this city is lit with gas and electric light, both being in the hands of private Companies. While the Gas Company had it their own way, gas was $4 per 1000 cubic feet; and they paid 12 per cent. dividend. Now it is only $2½; and they have not paid any dividend for the last two years, while the Electric Light Company pay 6 per cent. Three-fourths of the town's lighting is done by electric light now. As a final move, the Gas Company are trying hard to get the Electric Light Company to make a joint concern. I thought I would just mention these facts seeing we in Stirling are so interested in the questions of electric light and the purchase of the gas-works."

The Lead-Poisoning Epidemic in Derbyshire.—From time to time, references to this matter have appeared in the "JOURNAL;" but if all is true that was said at a meeting of the Chesterfield Rural District Council a few days since concerning the manner in which the tests have been made to discover the action of the water on lead, the statements that have been published must to some extent be discounted. It was reported by Dr. Macintosh that he found, from information supplied to him by doctors in the affected districts, that there had been twelve fresh cases since Christmas. Since chalk had been substituted for limestone to impregnate the water in the reservoirs, the percentage of lead present in the water had been as follows: Dec. 7, 0·45 grain per gallon; Dec. 12, 0·45 grain; Jan. 4, 0·38 grain; Jan. 19, 0·35 grain. Mr. Swallow remarked there had been a great scare among the general public in reference to lead-poisoning. He had all along been under the impression that the water sent for analysis was taken under ordinary conditions for the purpose; but it appeared that this was not the case. A tap had been sealed up for 24 hours in the longest pipe they had; and it was the water drawn from this pipe at the expiry of 24 hours that was tested for lead. No man would act so insanely as to seal up a tap for such a period, and then drink the water directly it came out; and, in his opinion, there should be a test of the water as used ordinarily by the consumers. Dr. Macintosh remarked that it was Dr. Barwise's assistant who sealed up the tap for 24 hours. That, however, had nothing to do with the samples reported on at the meeting. Twelve hours was the longest period that the water from which he (Dr. Macintosh) drew his test samples stood in the pipes. No one was drinking the reservoir water at Mosbro', and very few were doing so at Killamarsh. Mr. Whiting said he was prepared to prove that, in three or four alleged cases of lead-poisoning, the victims had not for years drunk water from the reservoirs. He thought an expert should be asked to pronounce upon the cases. The Chairman admitted that it was fair to suppose that, if a test of the water as ordinarily drawn were made, the lead might be as low as 0·02 grain per gallon, or even no lead at all. If water were allowed to remain in the pipes, of course, the acid acted upon the lead. One or two other members thought the tests were not reasonable ones, and that the public should know how they were made. No resolutions in regard to the matter were passed.

GAS AND WATER COMPANIES' STOCK AND SHARE LIST (see ante, p. 284).

Issue.	Share.	When ex-Dividend.	Dividend or Dividend & Bonus.	NAME.	Closing Prices.	Rise or Fall in Wk.	Yield upon Investment.
£			p. c.	GAS COMPANIES.			£ s. d.
590,000	10	15 Oct.	10½	Alliance & Dublin 10 p. c.	23—25	..	4 4 0
100,000	10	,,	7½	Do. 7 p. c.	17½—18½	..	4 1 1
300,000	100	2 Jan.	5	Australian (Sydney) 5% Deb.	108—111	..	4 10 11
200,000	10	29 Oct.	5	Belgrano (B. Ayres), Limited	10—10½	..	4 15 3
100,000	Stck.	30 Dec.	5	Do. 5 p. c. Deb. Stk	102—105	..	4 15 3
200,000	5	12 Nov.	6½	Bombay, Limited	6½—7½	+¼	4 6 8
40,000	5	,,	6½	Do. New, £4 paid	4½—5½	+½	4 14 6
380,000	Stck.	13 Aug.	12	Brentford Consolidated	290—295	..	4 1 4
210,000	,,	,,	9	Do. New	227—232	+2	3 17 7
50,000	,,	,,	5	Do. 5 p. c. Pref.	140—145	..	3 9 0
159,375	,,	11 Dec.	4	Do. 4 p. c. Deb. Stock.	130—134	..	2 19 9
220,000	Stck.	16 Sept.	11½	Brighton & Hove Original	270—275	..	4 3 7
208,820	,,	,,	8½	Do. A Ord. Stk.	187—192	..	4 8 7
933,500	Stck.	28 Aug.	5	Bristol, 5 p.c. max.	127—132	..	3 15 9
420,000	20	15 Oct.	11½	British	56½—57½	..	3 18 3
50,000	10	28 Aug.	11½	Bromley, Ordinary 10 p. c.	24—26	..	4 8 6
71,000	10	,,	8½	Do. 7 p. c.	19—21	..	4 0 11
500,000	10	15 Oct.	6	Buenos Ayres (New) Limited	10—10¾	..	5 14 3
200,000	100	2 Jan.	6	Do. 6 p. c. Deb.	101—103	..	5 16 6
150,000	20	14 Jan.	8½	Cagliari, Limited	29—31	..	5 6 5
100,000	10	30 Sept.	6	Cape Town & District, Ltd.	15½—16½	..	3 12 9
50,000	50	3 Nov.	6	Do. 6 p. c. 1st Mort.	57—59	..	5 1 8
550,000	Stck.	15 Oct.	13½	Commercial Old Stock	338—343	..	3 18 8
165,000	,,	,,	10½	Do. New do.	255—260	..	4 0 9
165,000	,,	11 Dec.	4½	Do. 4½ p. c. Deb. do.	150—155	..	2 18 0
800,000	Stck.	30 Dec.	13	Continental Union, Limited.	260—265	..	4 18 1
200,000	,,	,,	10	Do. 7 p. c. Pref.	215—220	..	4 10 11
51,600	Stck.	28 Aug.	14	Croydon Com'cial A 10 p. c.	315—320	..	4 7 6
163,400	,,	,,	11	Do. B 7 p. c.	250—255	..	4 6 3
535,000	Stck.	28 Aug.	5½	Crystal Palace Ord. 5 p.c. Stk	140—143	..	3 13 5
60,000	,,	,,	5	Do. 5 p. c. Pref.	140—145	..	3 9 0
486,090	10	14 Jan.	11	European, Limited	25—26	..	4 3 0
354,160	10	,,	11	Do. £7 10s. paid	17½—18½	..	4 6 11
5,746,590	Stck.	13 Aug	12¾	Gaslight & Coke, A, Ordinary	314—319	−4	3 19 0
100,000	,,	,,	4	Do. B, 4 p. c. max.	110—115	..	3 9 7
665,000	,,	,,	10	Do. C, D, & E, 10 p.c. Pf.	305—315	..	3 3 6
30 000	,,	,,	5	Do. F, 5 p. c. Prf.	147—152	..	3 5 9
63,000	,,	,,	7½	Do. G, 7½ p. c. do.	212—217	..	3 9 1
1.300,000	,,	,,	7	Do. H, 7 p. c. max.	209—214	+2	3 5 5
463,000	,,	,,	10	Do. J, 10 p. c. Prf.	305—315	..	3 3 6
476,000	,,	,,	6	Do. K, 6 p. c. Prf.	180—185	+2	3 4 10
1,061,150	,,	11 Dec.	4	Do. 4 p. c. Deb. Stk.	137—142	..	2 16 4
294,850	,,	,,	4½	Do. 4½ p. c. do.	150—155	−1	2 18 1
908,000	,,	,,	6	Do. 6 p. c. do.	207—212	..	2 16 7
70,000	10	29 Oct.	6	Hongkong & China, Limited	12—13	..	4 12 4
3,800,000	Stck.	12 Nov.	12	Imperial Continental	222—226	..	5 6 2
376,400	100	1 Aug.	4	Do. 4 p. c. Debs. Red.	99—102*	−1	3 18 5
473,600	Stck.	13 Aug.	3½	Do. 3½ p. c. Deb. Stk ,,	105—108	..	3 4 10
75,000	5	11 Dec.	6	Malta & Mediterranean, Ltd.	6—6½	..	4 12 4
560,000	100	1 Oct.	5	Met. of Melbourne, 5 p. c. Deb.	111—115	..	4 6 11
250,000	100	,,	4½	Do. 4½ p. c. Debs.	109—111	..	4 1 1
541,920	20	12 Nov.	5	Monte Video, Limited	15½—16½	..	6 1 3
150,000	5	26 Nov.	8	Oriental, Limited	8½—9	..	4 8 11
135,000	5	,,	8	Do. New, £4 10s. paid	7½—8	..	4 10 0
15,000	5	,,	8	Do. do. 1879, £1 paid	1½—2	..	4 0 0
60,000	5	16 Sept.	7	Ottoman, Limited	5—5½	..	6 7 3
420,000	100	2 Nov.	6	People's Gas } 1st Mtg. Bds.	100—105	..	5 14 3
500,000	100	1 Dec.	6	of Chicago } 2nd Do.	100—105	..	5 14 3
250,000	10	30 Sept.	10	San Paulo, Limited	13—14	+½	7 2 10
5,475,000	Stck.	13 Aug.	5 7/10	South Metrop., 4 p.c. Ord.	145—150	..	3 9 0
820,000	,,	14 Jan.	5	Do. 5 p. c. Deb. Stk.	169—172	..	2 18 2
60,000	Stck.	16 Sept.	11½	Tottenham & Edmonton, A	280—290	..	3 19 4
60,000	,,	,,	8½	Do. B	190—200	..	4 5 0
170,380	10	30 Dec.	10	Tuscan, Limited.	14—15	..	6 13 4
149,900	10	2 Jan.	5	Do. 5 p. c. Debs. Red.	101—103	..	4 17 1
				WATER COMPANIES.			
746,159	Stck.	30 Dec.	10½	Chelsea, Ordinary	333—338	..	3 2 2
150,000	,,	,,	5	Do. 5 p. c. Pref.	175—180	..	2 15 6
160,000	,,	,,	4½	Do. 4½ p. c. Pref. Stk., 1875	158—162	..	2 15 6
175,785	,,	30 Sept.	4½	Do. 4½ p. c. Deb. Stock	162—167	..	2 13 11
1,719,514	Stck.	15 Oct.	7	East London, Ordinary	232—237	..	2 19 1
554,740	,,	30 Dec.	4½	Do. 4½ p. c. Deb. Stk.	162—167	..	2 13 11
225,000	,,	,,	3	Do. 3 p. c. Deb. Stk.	105—107	..	2 16 1
700,000	50	11 Dec.	7½	Grand Junction, 10 p.c. max.	117—122	..	3 1 6
295,000	Stck.	30 Sept.	4	Do. 4 p. c. Deb. Stk.	150—155	..	2 11 7
708,000	Stck.	13 Aug.	12	Kent	345—350	+3	3 8 7
160,000	,,	,,	7	Do. New, 7 p. c. max.	215—220	..	3 3 7
1,043,800	100	30 Dec.	9½	Lambeth, 10 p. c. max.	275—280	+3	3 8 4
406,200	100	,,	7½	Do. 7½ p. c. max.	222—227	..	3 6 1
350,000	Stck.	30 Sept.	4	Do. 4 p. c. Deb. Stk.	150—153	..	2 12 3
500,000	100	13 Aug.	12 1/10	New River, New Shares	423—428	+1	2 18 8
1,000,000	Stck.	28 Jan.	4	Do. 4 p. c. Deb. Stk.	152—155*	..	2 11 7
902,300	Stck.	30 Dec.	6	S'thwk & V'xhall, Ordinary	155—160	+1	3 15 0
126,500	100	,,	6	Do. Do. 7½ p. c. Max.	149—155	+1	3 17 5
489,200	Stck.	,,	5	Do. Do. 5 p. c. Pref.	175—180	..	2 15 7
1,019,585	,,	30 Sept.	4	Do. 4 p. c. A Deb. Stk.	148—151	..	2 13 0
1,155,066	Stck.	11 Dec.	10	West Middlesex	312—317	+2	3 3 1
200,000	,,	,,	4½	Do. 4½ p. c. Deb. Stk.	163—168	..	2 13 7

*Ex div.

The Recent Conviction of the Crystal Palace District Gas Company.—The Clerk to the Beckenham Urban District Council has received notice of appeal by the Crystal Palace District Gas Company from the decision of the Bromley Magistrates in the case of the alleged deficient illuminating power of the Company's gas, as reported in the "JOURNAL" last week. The Council have given instructions for the briefing of Counsel on their behalf.

The Position of the Teignmouth Gas Undertaking.—In the paragraph dealing with this subject in the last number of the "JOURNAL," it was stated that the Teignmouth Urban District Council had adopted a recommendation of the Gas Committee to accept Mr. G. Livesey's terms for inspecting and reporting upon the gas-works. We learn that this gentleman was applied to some two or three years ago, to advise on the matter; but he declined. It is Mr. Frank Livesey who has now been asked to assist the Council.

The Cost of Haulage at the Coventry Gas-Works.—Replying to an inquiry by Alderman Singer at last Tuesday's meeting of the Coventry City Council, Alderman Andrews imparted to the members some interesting information concerning the cost of haulage to and from the gas-works. He said that the coal conveyed to the works last year amounted to 50,000 tons; 18,000 tons of material was carted from the works to the station; and 2000 tons of sundries were also carted—making a total of 70,000 tons for the year. The cost of transferring the coal from the station to the works was about 1s. 1d. a ton; and, putting it at 1s., the total expense for cartage was £3500. Since the time the railway siding was first under consideration, the haulage had doubled; and there had been complaints that carting had recently gone on during the night as well as day. Mr. Lee asked if Alderman Andrews did not submit figures during the discussion on the railway siding, showing that a siding would save the ratepayers from £1500 to £1700 a year. Alderman Andrews said the figures he then gave were supplied by Mr. Wood, the Engineer whom the Council consulted.

The Public Lighting of Canterbury.—The Canterbury Gas and Water Company recently informed the Lighting Committee of the Canterbury Town Council that they were willing to enter into a contract for the public lighting for another year. At the same time, however, they suggested that incandescent burners should be adopted, and generously offered to make the necessary alterations for the purpose, at their own cost, if the contract was extended for a suitable term of years, at the price paid for the existing lights. Influenced no doubt by the Corporation electric lighting scheme, the Lighting Committee recommended the Council to send a reply to the Company to the effect that, while they would gladly welcome any improvement in the lighting of the Company, they were not prepared to enter into a contract for a term of years. On this recommendation coming before the Council last Wednesday, Mr. Dean charged the Committee with having shown great hostility to the Company; and he moved an amendment that the letter be referred back to the Committee, with an instruction that they endeavour to make terms with the Company for the more efficient lighting of the city. Several members sided with Mr. Dean; and, by eleven votes to seven, his amendment was agreed to.

Abolition of Meter-Rents at Malmesbury.—The Malmesbury Gas Company have decided to abolish meter-rents as from the 1st ult.

The New Gas-Works at Southborough.—The Southborough Urban District Council last Thursday received in Committee a report from Mr. Corbet Woodall, M.Inst.C.E., on the proposed new gas-works. Three schemes for increasing the supply of gas were considered. The first proposed to enlarge the present works at an estimated expenditure of £13,000; the second, the adoption of a water-gas plant; and the third, the purchase of gas in bulk from the Tunbridge Wells Gas Company. We learn that the scheme which found most favour was the third; so that this will probably be recommended to the Council for approval at their next meeting.

Mr. John Bain, formerly with Messrs. Slight and M'Kimmie, has joined the firm of Messrs. Marks and Son, cannel and gas coal merchants, of Glasgow.

The Directors of the Gas, Water, and General Investment Trust, Limited, recommend a final dividend at the rate of 4½ per cent. per annum on the preferred stock, and 3 per cent. per annum on the deferred stock for the half year ended the 28th ult.

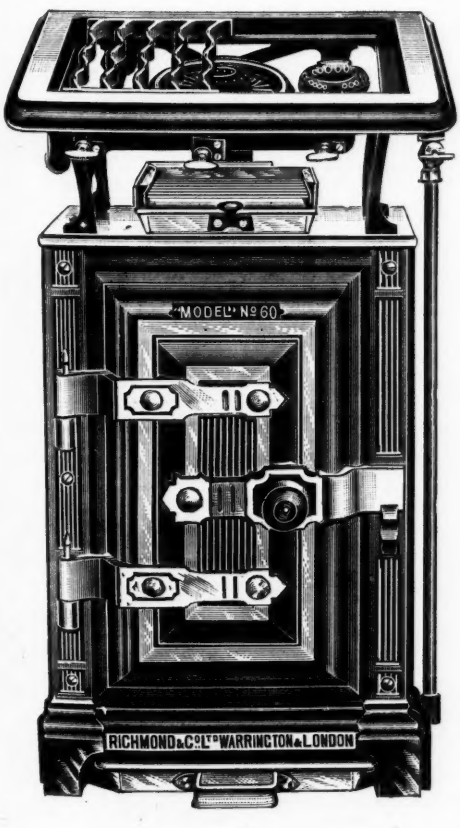
The Ilkeston Corporation have placed with Messrs. R. Dempster and Sons, Limited, of Elland, the order for the recently advertised retort-stack. The benches are to be constructed on the latest regenerator principle, with patent automatic steam supply to the furnaces.

Messrs. W. J. Jenkins and Co., of Retford, have received from the Oldham Corporation Gas Committee an order for a travelling gantry and four large coke-hoppers for their Higginshaw works, together with the gas-engine, shafting, and automatic coke-screening plant in connection therewith.

Messrs. Kirkham, Hulett, and Chandler, Limited, have received an order from the Ramsgate Corporation for a "Standard" washer-scrubber for 1,500,000 cubic feet of gas per day; also for a Marshall tar extractor of the same capacity. This firm sent out early last year to Shanghai one of the latter machines; and we learn that it is working to the entire satisfaction of the Engineer (Mr. Hiller).

Mr. F. A. Hull, the President of the Log Mountain Company, Pineville, Kentucky, the owners of the Bear Creek Colliery, who is now in London, informs us that the Company have discontinued their London agency (formerly held by Messrs. Wilson and Co., of Cannon Street), and will now treat with consumers direct. The Company's card, with their cable address, will be found in our advertisement columns.

In another part of the "JOURNAL" will be found the prospectus of the Hyde Cycle and Machinists' Company, Limited, which has been registered with a capital of £25,000, in 12,000 ordinary, 12,000 6 per cent. preference, and 1000 founders' shares, to acquire the business of the Brooke Cycle Manufacturing Company, of Hyde, Cheshire. The Chairman of the new Company is Mr. E. W. T. Richmond, who is well known to many of our readers as the Chairman of Messrs. Richmond and Co., Limited.



RICHMOND & CO., LTD.

WARRINGTON & LONDON.

NEW SIZE. No. 60.

£5.

RICHMOND'S CELEBRATED

"MODEL"

Gas Cooking Range

Fitted with Taps in Front, without extra charge.

SUPPLIED WITH PATENT LOOSE WHITE ENAMELLED CROWN-PLATE, AND REMOVABLE BURNERS.

IT WILL PAY GAS ENGINEERS AND MANAGERS TO SEE THIS NEW COOKER.

GWYNNE & BEALE'S
PATENT GAS EXHAUSTERS AND ENGINES.

Telegrams: "GWYNNEGRAM, LONDON." Telephone No. 65,095.

GWYNNE & CO.,

HYDRAULIC AND GAS ENGINEERS,

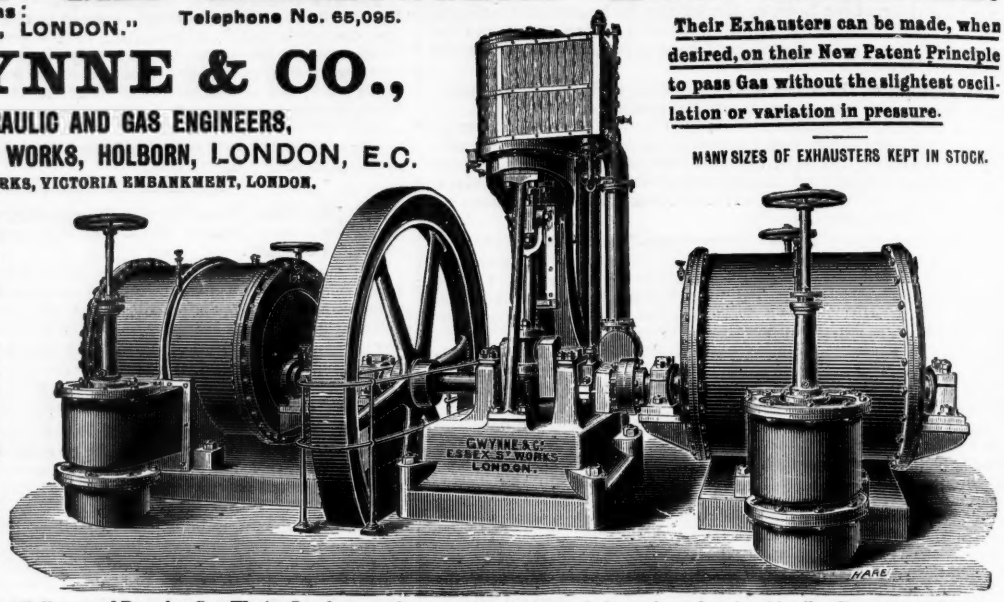
BROOKE STREET WORKS, HOLBORN, LONDON, E.C.

Late ESSEX STREET WORKS, VICTORIA EMBANKMENT, LONDON.

They have completed Exhausters to the extent of 32,000,000 cubic feet passed per hour, which are giving unqualified satisfaction in work.

Makers of GAS-VALVES, HYDRAULIC REGULATORS, VACUUM GOVERNORS, PATENT RETORT-LIDS, STEAM-PUMPS for Tar, Liquor, or Water; CENTRIFUGAL PUMPS and PUMPING ENGINES, specially adapted for Water-Works, raising Sewage, &c.

Also GIRARD and other TURBINES, HIGH SPEED ENGINES, DYNAMOS, &c., &c., for ELECTRIC LIGHTING.



Their Exhausters can be made, when desired, on their New Patent Principle to pass Gas without the slightest oscillation or variation in pressure.

MANY SIZES OF EXHAUSTERS KEPT IN STOCK.

Exhausting Machinery at Fulham and Bromley Gas-Works, London—each set passing 400,000 cub. ft. per hour drawing 14 miles distant from Beckton.

Catalogues and Testimonials sent on application.

GAS PURIFICATION AND CHEMICAL COMPANY, LIMITED.

OXIDE OF IRON.

O'NEILL'S Oxide has a larger annual sale in the United Kingdom than all other Oxides combined. Purity and uniformity of quality guaranteed. Pamphlet, "How to Purchase Bog Ore," to be obtained on application.

JOHN WM. O'NEILL, Managing Director, Palmerston Buildings, Old Broad Street, London, E.C.

ANDREW STEPHENSON, AGENT. All communications re Oxide to be addressed to Palmerston Buildings.

WINKELMANN'S "VOLCANIC" CEMENT. Fire Resistance up to 4500° Fahr. in use in most Continental Gas-Works, and in more than 300 British Gas-Works.

ANDREW STEPHENSON, 182, GRESHAM HOUSE, OLD BROAD STREET, LONDON, E.C.

Telegrams: "Volcanism, London."

AMMONIACAL LIQUOR wanted.

BROTHERTON AND Co., Ammonia Distillers. Works: BIRMINGHAM, LEEDS, and WAKEFIELD.

GAS TAR wanted.

BROTHERTON AND Co., Tar Distillers. Works: BIRMINGHAM, LEEDS, and WAKEFIELD.

SPENT OXIDE wanted.

BROTHERTON AND Co., Chemical Manufacturers. Works: BIRMINGHAM, LEEDS, and WAKEFIELD.

SULPHURIC ACID for Sale.

BROTHERTON AND Co., Chemical Manufacturers. Works: BIRMINGHAM, LEEDS, and WAKEFIELD.

BROTHERTON & CO.

Offices: Commercial Buildings, LEEDS. Correspondence invited.

TUBES for Gas, Steam, and Water (all Sizes), Welded or Riveted. TANKS, HYDRAULIC MAINS, RETORT-LIDS, &c.

JOHN SPENCER, Globe Tube Works, WEDNESBURY; and 14, Great St. Thomas Apostle, LONDON.

HUTCHINSON BROTHERS, Gas Engineers, &c., Falcon Works, Barnsley, Makers of Wet and Dry Gas-Meters, Brass-Work, and general Gas Apparatus, Lead Saturators, Tanks, &c., Tools, and Gas-Works Sundries. (See p. 259, last week's issue.)

Telegrams: "HUTCHINSON BROS., BARNSLEY."

HYDRATED OXIDE OF IRON.

PREPARED from pure Iron.

Two or three times as rich as Bog Ore.
Strong action on Sulphuretted Hydrogen.
To be used alone, but will increase activity of other Oxides.
Less than half the price of Bog Ore.
Can be lent on hire.
Write for tabulated results.

READ HOLLIDAY AND SONS, LIMITED, HUDDERSFIELD.

J. & J. BRADDOCK, Globe Meter Works, Oldham.

First-Class Award, Melbourne Exhibition, 1889, for WET AND DRY GAS-METERS, STATION METERS, AND GOVERNORS, PRESSURE-GAUGES, STREET LAMPS AND PILLARS, &c.

Telegraphic Address: "Braddock Oldham."

SULPHURIC ACID.

JOHN NICHOLSON & SONS, Limited, Chemical Works, Leeds, specially produce this ACID from SULPHUR, for making SULPHATE OF AMMONIA of high quality and *good* colour. Delivery in our own Railway Tank-Wagons or Carboys. Highest references and all particulars supplied on application.

PORTER & CO., Gowts Bridge Works, LINCOLN, Engineers, Ironfounders, and Contractors for the erection of Gas-Works for Towns, Villages, Mansions, Manufactories, Collieries, and Isolated Buildings at home and abroad. Manufacturers of Retorts and Fittings, Condensers, Scrubbers, Purifiers, Valves, &c.; also of Girders, Wrought and Cast Iron Tanks, Iron Roofs, &c.

Telegraphic Address: "PORTER LINCOLN."

[For Illustrated Advertisement, see Feb. 2, p. 258.]

SADLER & Co., Ld., Middlesbrough; ULVERSTON (BARROW); PORTSMOUTH; CARLTON (N.E.R.); and STOCKTON. Tar and Petroleum Distillers. Benzol and Petroleum Spirit, 700 and other Gravities specially prepared for Carburetting. SOLAR OIL for Gas Making, Kerosene, &c.

Correspondence invited.

Telegraphic Address: "Sadler, Middlesbrough."

NEW GAS PLANT CEMENT.

JOHN E. WILLIAMS AND CO., VICTORIA PAINT WORKS, MANCHESTER.

For all Joints in connection with Oil-Gas Plant and Sulphate Plant.
For all Gas Joints.
For all Tar Joints.
For all Ammonia Joints.

SULPHATE OF AMMONIA SATURATORS.

WALTER THOMASON and SONS, Chemical Plumbers, &c., and Makers of Lead Saturators, &c., 21, WESTON STREET, BOLTON. Repairs of every description.

Please write for Estimate before ordering elsewhere.

PATENTS FOR INVENTIONS.

J. C. CHAPMAN, M.I.M.E. and Fel. Chartered Inst. Patent Agents. ADVICE ON ALL MATTERS CONNECTED WITH ABOVE. Information and Handbook on application. 70, CHANCERY LANE, LONDON, W.C.

ECONOMY IN PURIFICATION.

INCREASE the Efficiency of your PURIFIERS by adopting CRIPPS'S PATENT BYE-PASS VALVE in the lower Tiers of Sieves. Practical Experience proves their Economy. Engineers are repeating orders after thorough trial.

References and Particulars can be obtained from the Makers—

C. & W. WALKER, Midland Iron-Works, Donnington, near Newport, SALOP.

And J. EVERY & SON, Phœnix Iron-Works, LEWES.

GAS PURIFICATION.

OXIDE OF IRON BOG ORE.

BALE & CO.'S Oxide of uniform quality. Sample and Price on application.

OXIDE PAINTS, OILS, SULPHURIC ACID, &c. 120 and 121, NEWGATE STREET, LONDON, E.C.

Telegrams: "BOGORE, LONDON."

OXIDE OF IRON.

FINEST Quality of Natural Bog Ore. Particulars and price, apply to Mr. T. L. ARCHER, 20, Fennel Street, MANCHESTER.

SULPHATE OF AMMONIA SATURATORS.

JOSEPH TAYLOR & CO., Chemical Plumbers, &c., and Makers of every description of Solid Plate Lead and Timber Cased Saturators, &c. CENTRAL PLUMBING WORKS, TOWN HALL SQUARE, BOLTON. Special Attention to Repairs.

Before placing Orders, please write for Estimate.

CANNEL, COAL, ETC.

JOHN ROMANS & SON, EDINBURGH, Gas Engineers, supply all the most approved SCOTTISH CANNELS; also FIRE-CLAY GOODS, CAST-IRON PIPES, and other APPARATUS for GAS and WATER WORKS.

Prices, &c., will be forwarded on application to No. 80, ST. ANDREW SQUARE, EDINBURGH, NEWTON GRANGE, NEWBATTLE, DALKEITH, } SCOTLAND.

In Paper Covers, Post Free 2s.

STEPHEN CARPENTER, late of the Bow Common Gas-Works, on the PURIFICATION OF COAL GAS BY LIME, &c., and the Method of Working Lime Purifiers so that the Lime may be used a second time, with a Description of a short Method of Working the Sulphur Test.

S. CARPENTER, "Ryde," Woodhouse Grove, East Ham, ESSEX; or of H. W. CARPENTER, 3, Bedford Villas, Carshalton, SURREY.

GAS, Water, and Electric Lighting, The LAW OF. By MICHAEL and WILL. Fourth Edition. Re-written and brought down to September, 1894, by J. SHIRESS WILL, Q.C., Esq. *Royal 8vo. Price 32s., Cloth; for Cash, Post Free, 26s. 6d.*

"Pains have been taken to treat more fully many subjects of constantly recurring importance to those concerned—such as the Law relating to the Breaking-up of Streets, and the Maintenance therein of the various Appliances connected with the Water Supply, &c."—*Extract from Preface.*

BUTTERWORTH AND Co., 7, FLEET STREET, E.C.

WANTED, a Situation as Working MANAGER, accustomed to Main and Service Laying, Meter Fixing, Stoves and Cookers, and taking Indices. Good Carbonizer. Married, and an Abstainer. Good References.

Address No. 2793, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

GENTLEMAN, with knowledge of DRAWING and Experience in TRAVELLING and general routine of Gas Engineer's Office, is open to Engagement. Has good connection with Gas Companies, and no objection to go abroad.

Address No. 2786, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, at once, an Inside Gas- FITTER for Fittings and Meters.
Apply, by letter, with Character, to No. 2796, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

SERVICE LAYER WANTED.

WANTED, immediately, a steady re- liable FITTER as outdoor Service Layer for a Gas Company in South Wales.
Apply, by letter, with Character, to No. 2795, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, two thoroughly good steady men as leading STOKERS. Capable of taking charge of men for Day and Night Shifts. Must be good Carbonizers, and used to Scoop, Engine and Exhauster. None but good men need apply. Wages 35s. per week.
References to THOS. WEBB, Gas-Works, STAINES.

DEPUTY MANAGER AND ASSISTANT SECRETARY TO WATER COMPANY.

WANTED, a Gentleman, aged 25 to 35, energetic, and of good general business capacity, an Engineer by profession and experience, and conversant with water-works undertakings. To a suitable Candidate, this offers a favourable opening.
Apply, by letter, stating Salary required, and with not more than three recent testimonials, to No. 2794, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

MERTHYR TYDFIL GAS COMPANY.

WANTED, immediately, Two Wrought- IRON-PIPE FITTERS for Interior Work. Only experienced and skilful Workmen of good character and sober habits need apply. Wages, 30s. per week.
JOHN L. COCKER,
Secretary and General Manager.
Gas Offices, Gas-Works,
Merthyr Tydfil, Glamorganshire,
Jan. 28, 1897.

GAS TAR and Ammoniacal Liquor Wanted.
Apply to JOSIAH HARDMAN, Milton, STAFFS.

WANTED, a Second-hand Station METER, 20,000 feet per hour.
State Price, Maker's Name, Date, and Condition, to No. 2792, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, to purchase Gas Carbon delivered at nearest Station to Gas-Works, in quantities of not less than 4 tons.
Address, stating Price per ton and quantity, No. 2772, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

FOR SALE, Cheap—A Gasholder, 14 ft. by 10 ft. complete with Columns, Chains, Weights, &c. Good condition.
Apply to the CHEDDAR VALLEY MANUFACTURING COMPANY, Cheddar, SOMERSET.

FOR SALE, Second-hand—A Station GOVERNOR, 6-inch Connections, and Bye-Pass. Makers, Messrs. Laidlaw (1876). In good order when last working (July, 1896).
Apply to the GAS MANAGER, MILLOM.

GAS PLANT for Sale—I can always offer NEW and SECOND-HAND GAS APPARATUS, including Retorts and Fittings, Condensers, Exhausters, Scrubbers, Washers, Purifiers, Gasholders, Tanks, Valves, Connections, &c. Also COMPLETE WORKS equal to 7000, 20,000, 60,000 cubic feet per diem. **Inquire and compare Prices and Particulars before ordering elsewhere.**
J. F. BLAKELEY, Gas Engineer, Ravensthorpe, YORKS.

TO RETORT AND FIRE-BRICK MANUFACTURERS.

THE Corporation of Birkenhead are prepared to receive TENDERS for RETORTS, FIRE-BRICKS, BLOCKS, and FIRE-CLAY required at their Gas-Works during the current year.
Forms of Tender may be obtained from Mr. T. O. Paterson, C.E., Gas Engineer, Gas-Works, Thomas Street.
Tenders, sealed and endorsed "Tenders for Retorts, &c.," to be sent in to me not later than Five o'clock in the afternoon of Friday, the 19th day of February, 1897.
The Corporation do not bind themselves to accept the lowest or any tender.
By order,
ALFRED GILL,
Town Clerk.
Town Hall, Birkenhead,
Feb. 6, 1897.

TO GASHOLDER MAKERS.

THE Hyde Gas Company invite Tenders for the Construction and Erection of a TELESCOPIC GASHOLDER.
The Drawings and Specification may be seen at the Gas Office, Hyde, and at 5, Norfolk Street, Manchester, the Office of the Engineers, Messrs. Thomas Newbigging and Son.
Copies of the Bill of Quantities and Form of Tender may be obtained from the latter, on deposit of Two Guineas, which will be returned on receipt of a *bonâ-fide* tender.
Sealed tenders, endorsed "Gasholder Contract No. 1," to be addressed to the undersigned, and delivered not later than Twelve o'clock noon, on Wednesday, the 24th day of February, 1897.
WILLIAM SMITH,
Secretary and Manager.
Gas Offices, Hyde,
Feb. 5, 1897.

TENDERS are invited for Lighting the City of S. PAULO (BRAZIL) BY GAS, and must be sent under sealed covers, marked "Illuminaçao a Gaz da Cidade de S. Paulo," to the Secretaria da Agricultura, Commercio, e Obras Publicas (Department of Agriculture, Commerce, and Public Works), in time to reach the said Department not later than Three o'clock p.m., on April 30, 1897.
Particulars may be had on application, by letter, to the BRAZILIAN LEGATION, LONDON; or to the BRAZILIAN CONSULATES in LONDON, LIVERPOOL, or GLASGOW.

BOROUGH OF BARROW-IN-FURNESS.
(GAS AND WATER DEPARTMENT.)

TENDERS FOR GENERAL STORES.

THE Corporation are prepared to receive TENDERS for the supply of FIRE-CLAY RETORTS and BRICKS, WROUGHT-IRON TUBES and FITTINGS, BRASS COCKS, GAS-METERS, OIL and PAINT, SULPHURIC ACID, LIME, IRONMONGERY, &c., as may be required from the 1st day of April next to the 31st of March, 1898.
Sealed tenders, on Forms to be obtained at the Office of the Manager of the Gas and Water Works, addressed to the Chairman of the Gas and Water Committee, and endorsed "Tenders for Stores," to be delivered at the Town Clerk's Office, on or before Tuesday, the 16th inst.
The lowest or any tender not necessarily accepted.
By order,
C. F. PRESTON,
Town Clerk.
Town Hall, Barrow-in-Furness,
Feb. 4, 1897.

BOROUGH OF BARROW-IN-FURNESS.

THE Corporation are prepared to receive TENDERS for the purchase of the surplus TAR produced at their Gas-Works from the 1st day of April next to the 31st day of March, 1898, delivered into Purchaser's Tank-Waggons at the Gas-Works Siding.
Any further Information may be had on application to the Manager of the Gas-Works.
Sealed tenders, addressed to the Chairman of the Gas and Water Committee, and endorsed "Tender for Tar," to be delivered at the Town Clerk's Office, on or before Tuesday, the 16th inst.
The highest or any tender not necessarily accepted.
By order,
C. F. PRESTON,
Town Clerk.
Town Hall, Barrow-in-Furness,
Feb. 4, 1897.

BOROUGH OF BARROW-IN-FURNESS.

THE Corporation are prepared to receive TENDERS for the supply and erection, at their Gas-Works at Barrow-in-Furness, of four PURIFIERS, with Covers and Wood Grids, complete.
Drawings and Specification may be seen and all necessary Information obtained, at the Office of the Gas and Water Works Manager.
Sealed tenders, addressed to the Chairman of the Gas and Water Committee, and endorsed "Tender for Purifiers," to be delivered at the Town Clerk's Office not later than Twelve o'clock noon, on Wednesday, the 17th inst.
The lowest or any tender not necessarily accepted.
By order,
C. F. PRESTON,
Town Clerk.
Town Clerk's Office, Barrow-in-Furness,
Feb. 5, 1897.

SHEFFIELD UNITED GASLIGHT COMPANY.

RETORT-HOUSE AND COAL-STORES.
TO BUILDERS AND CONTRACTORS.

THE Directors of this Company invite TENDERS for the erection of RETORT-HOUSE, COAL-STORES, &c., including Foundations and Drainage Work in connection therewith, at their Grimesthorpe Station.
The Main Buildings are 351 feet long by 146 feet wide and 44 feet high to Eaves; and the Foundations and Drainage will comprise some 7500 Cubic Yards of Excavation, 3400 Cubic Yards of Cement Concrete, 1100 feet run of 18-inch Brick Barrel Drain, &c.
Drawings and Specification may be seen, and Bill of Quantities, with Form of Tender obtained, on application to the Engineer, Mr. Fletcher W. Stevenson, on payment of One Guinea, which will be returned on receipt of a *bonâ-fide* tender.
Sealed tenders, endorsed "Tender for Retort-House," must be delivered by post to the undersigned, at the Company's Offices, not later than the first post on Saturday, the 27th inst.
The Directors do not bind themselves to accept the lowest or any tender.
HANBURY THOMAS,
General Manager and Secretary.
Commercial Street, Sheffield,
Feb. 2, 1897.

SHEFFIELD UNITED GASLIGHT COMPANY.

LIQUOR TANK AND GENERAL BUILDERS' CASTINGS.
TO ENGINEERS, IRONFOUNDERS, &c.

THE Directors of this Company invite TENDERS for the supply and erection of a CAST-IRON LIQUOR TANK, 25 feet square, and the supply and delivery of GENERAL BUILDERS' CASTINGS for their Retort-House at Grimesthorpe Station.
Drawings may be seen, and Specification, with Bill of Quantities, obtained, on application to the Engineer, Mr. Fletcher W. Stevenson, on payment of 10s. 6d., which will be returned on receipt of a *bonâ-fide* tender.
Sealed tenders, endorsed "Tender for Tank and Castings," must be delivered to the undersigned by post, at the Company's Offices, not later than the first post on Saturday, the 27th inst.
The Directors do not bind themselves to accept the lowest or any tender.
HANBURY THOMAS,
General Manager and Secretary.
Commercial Street, Sheffield,
Feb. 6, 1897.

THE Knutsford Light and Water Com- pany invite TENDERS, with Plans and Specifications, for the complete erection of PLANT for FIVE BEDS of RETORTS on the Generator System. The Retorts to be 15 in. by 21 in. by 9 ft. 6 in.
For further Particulars, apply to the Manager, Gas-Works, Knutsford.
Tenders to be sent in to the Chairman, on or before the 19th of February inst.

BOROUGH OF HEYWOOD.

THE Gas Committee invite Tenders for the supply of about 10,000 Tons of COAL (Screened, Unscreened, Nuts, or Cobbles) and 500 Tons of CANNEL.
Specification and Form of Tender may be obtained on application to Mr. W. Whatmough, Gas Manager.
Sealed tenders, marked "Coal," to be sent to me not later than Tuesday, Feb. 16, 1897.
By order,
J. H. BALDWICK,
Town Clerk.
Municipal Buildings, Heywood,
Jan. 28, 1897.

TENDERS FOR GAS-MAINS.

THE Dover Gaslight Company invite TENDERS for 500 yards of 12-inch CAST-IRON GAS-MAINS, with Connections, and 750 yards of similar SMALLER MAINS.
Particulars, with Forms of Tender, can be obtained on application to me the undersigned.
The Company do not bind themselves to accept the lowest or any tender.
Tenders, marked "Tender for Mains," to be delivered on or before Saturday, the 20th inst., to me.
G. FIELDING,
Secretary.
Dover Gaslight Company,
14, Snargate Street, Dover.

MANCHESTER CORPORATION GAS-WORKS.

TO CONTRACTORS.

TENDERS are invited for a Steel CHARGING-FLOOR, to be erected in "C" Retort-House, at Rochdale Road Gas-Works.
Drawings may be seen, and general Conditions of Contract, Specifications, and Bill of Quantities obtained, on application (in writing only) to Mr. C. Nickson, Superintendent of the Gas Department, Town Hall.
Tenders, endorsed "Tender for Steel Charging-Floor," and addressed to the Chairman of the Gas Committee, to be delivered at the above Office not later than Ten a.m., on Thursday, the 18th inst.
The Corporation do not bind themselves to accept the lowest or any tender.
(Signed) WM. HENRY TALBOT,
Town Clerk.
Town Hall, Manchester,
Feb. 5, 1897.

LIVERPOOL UNITED GASLIGHT COMPANY.

TAR.

THE Directors of the Liverpool United Gaslight Company are prepared to receive TENDERS for the TAR produced at their several Works for a period of One Year from July 1, 1897.
The quantities of Tar produced per annum are estimated to be as follows; but the same cannot be guaranteed, and may be more or less:—

At the Athol Street Works, about			720,000	gallons.
"	Eccles Street	"	354,000	"
"	Caryl Street	"	614,000	"
"	Waverтree	"	560,000	"
"	Linacre	"	2,700,000	"
"	Garston	"	200,000	"

The Tenders may be for the whole, or for one or more of the Works separately.
Forms of tender and full Particulars may be obtained on application to the undersigned.
Tenders, sealed and endorsed "Tender for Tar," are to be delivered here not later than the 20th of February 1897.
The Directors reserve to themselves the right to accept any tender in part or in whole, and do not bind themselves to accept the highest or any tender.
By order,
WILLIAM KING, Engineer.
Gas Office, Duke Street, Liverpool,
Feb. 5, 1897.

BOROUGH OF RICHMOND, SURREY.

WATER-WORKS AND PUBLIC BATHS.
TENDERS FOR WELSH SMOKELESS STEAM COAL.

THE Town Council for the Borough of Richmond, Surrey, invite TENDERS for the supply of about 1400 Tons of best WELSH SMOKELESS STEAM COAL, to be delivered in Barges of about 40 Tons alongside the Wharf, opposite the Water-Works, Richmond, for One Year, from March 31, 1897. The Seam and District from which the Coal is to be supplied must be stated in the tender.
Particulars and Forms of Tender can be obtained of Mr. W. G. Peirce, Engineer at the Water-Works. No tender will be recognized unless it is made on the prescribed form, properly filled up in every respect; and no expenses or claim will be allowed or paid to any person, whether tendering or not.
The Security stipulated by the Public Health Act, 1875, for the due performance of the Contract will be required. The Contract and Bond will be prepared by the Town Clerk.
Sealed tenders, endorsed "Tender for Welsh Coal," and addressed to the Chairman of the Water Supply Committee, Borough of Richmond, Surrey, must be delivered at the Town Clerk's Office, by Ten o'clock on Tuesday, the 2nd day of March, 1897.
The Council do not bind themselves to accept the lowest or any tender.
FREDK. B. SENIOR,
Town Clerk.
Town Clerk's Office, Town Hall,
Richmond, Surrey, Feb. 2, 1897.

Application List will open on Monday, the 8th February, and close on Thursday, the 11th February, 1897.

THE HYDE CYCLE AND MACHINISTS' CO., Ltd.

Registered under the Companies' Acts, 1862 to 1890.

SHARE CAPITAL - - - - - - £25,000

12,000 £1 ORDINARY, 12,000 £1 6 PER CENT. PREFERENCE, AND 1000 £1 FOUNDERS.

PRESENT ISSUE - - - - - - - £20,000

Divided into 12,000 Ordinary Shares of £1 each; 7000 Six per cent. Cumulative Preference Shares of £1 each, with priority as to Capital; 1000 Founders' Shares of £1 each, which rank with Ordinary as to capital and dividend, but after 10 per cent. has been paid they take one-third of the remaining profits.

The Vendors receive £6000—viz., 3500 in fully-paid Ordinary Shares, 500 in fully-paid Founders' Shares, and the balance of £2000 in cash.

The Calls on the Shares will be payable as follows: 5s. on application, 5s. on allotment, and the balance in calls of not more than 5s. and with not less than three months' interval.

DIRECTORS:

E. W. T. RICHMOND, Winmarleigh Street, Warrington (Chairman), Chairman Messrs. Richmond and Co., Ltd., Gas Apparatus Manufacturers, Warrington and London.

Councillor JOHN WM. POLLITT, Mayfield, Ashton-under-Lyne, Carting Agent and Contractor.

WILLIAM ARTHUR ASPLAND, Stockport Road, Hyde, Cotton Spinner.

*CHARLES EDMUND BROOKE, Brooklyn House, Chapel Street, Hyde, Iron Merchant and Cycle Manufacturer.

*JOSEPH COUPE HOLFORD, Hill House, Godley, Cycle Manufacturer.

* The Vendors will join the Board after allotment.

BANKERS:

THE LONDON AND MIDLAND BANK, LTD., Hyde and Branches. London Offices: 52, Cornhill, E.C.

SOLICITORS:

HIBBERT AND WESTBROOK, Clarendon Place, Hyde, and 17, Brazennose Street, Manchester.

AUDITOR:

WILLIAM CHADWICK, Chartered Accountant, 10, Market Place, Hyde.

SECRETARY:

CHARLES T. BILLINGE, Cross Street, Hyde.

REGISTERED OFFICE:

CROSS STREET, HYDE.

PROSPECTUS.

This Company is formed to acquire as a going concern the successful business of Cycle Manufacturers previously known as "The Brooke Cycle Manufacturing Company," makers of high-class Cycles, and carrying on business at Cross Street, Hyde, together with the fixed plant, machinery, plating and enamelling plants, tools, stock-in-trade, book debts, goodwill, and the benefit of all existing contracts as from the 1st day of October, 1896.

The business was established in February, 1895, as a branch of the business of Messrs. W. Brooke and Sons, Ironmongers and Iron Merchants, of Hyde, established 1837. It has increased so considerably that, in consequence of such increase, and for its separate and better development, it is considered advisable to form a Company for the purpose of its acquisition.

The premises occupied by the Company are specially adapted for the manufacture of cycles. They are fitted throughout with the best machinery and best tools that can be obtained, and form one of the most completely equipped cycle manufactories in the district.

Mr. C. E. Brooke, the owner of the premises where the business is carried on, has agreed to lease the premises to the Company for a term of years upon terms favourable to the Company, and terminable by twelve months' notice at the option of the Company.

In addition to the manufacture of the complete machines, a large and increasing trade it is expected will be done in the manufacture and sale of the component parts.

Considerable alterations and additions have been made to the works during the past few months, which will enable the Company to increase their output to five times the extent of the past year's trading. (See illustration of works enclosed with Prospectus.)

Messrs. Charles Edmund Brooke and Joseph Coupe Holford, the original founders of the business, have agreed to act as Managing-Directors, upon most moderate salaries and commission on profits, for a period of at least five years; thus ensuring to the Company the same management that has been so successful in the past. They have also entered into an agreement with the Company not to carry on, or be interested in, any competing business during the period of five years after they respectively shall cease to be Managing-Directors.

The firm at the present time have orders on hand for a large number of cycles; and, with the additional capital and turnover, and taking the basis of profit shown, it is confidently expected that a dividend of at least 10 per cent on the ordinary Shares will be paid and a good balance carried forward.

The past year's trading has been of such a satisfactory nature (having shown a return on the capital employed of over 10 per cent. after all management and other expenses have been paid) as to warrant the Directors in this belief. They are this year again devoting their attention specially to the cultivation of orders for the highest class machines. (See illustrations enclosed with prospectus.)

Large contracts for the purchase of the raw material have already been entered into at most favourable prices, much under present quotations; and the Company will get the benefit of these contracts.

The price to be paid for the business, goodwill, plating and enamelling plants, machinery, and stock-in-trade, guaranteed book debts, &c., has been fixed by the Vendors at £6000, payable as to £3500 in Ordinary Shares, £500 in Founders' Shares, and the balance of £2000 in cash; all liabilities being paid by the Vendors to Oct. 1, 1896.

As a proof of their confidence in the business, the Vendors are taking the greater part of the purchase money in shares.

Powers are given by the Articles of Association to introduce a scheme of profit-sharing amongst the employees of the Company.

The following Contracts have been made, namely:—

(1) A Contract dated the 25th day of January, 1897, made between Charles Edmund Brooke and Joseph Coupe Holford of the one part, and Edmund Walter Tyrrell Richmond, John William Pollitt, and William Arthur Aspland of the other part.

(2) A Contract dated the 25th day of January, 1897, made between Charles Edmund Brooke and Joseph Coupe Holford of the one part, and the Company of the other part.

The business will be taken over subject to all existing Contracts. These are of the ordinary trade character, and necessary for the working of the concern, but including, as they do, Contracts with employees, customers, and others, they cannot be specified.

There may be also other Contracts which may technically fall within Section 38 of the Companies' Acts, 1867. Subscribers will be held to have had notice of all these Contracts, and to have waived all right to be supplied with particulars of such Contracts, and to have agreed with the Company as trustee for the Directors and other persons liable, not to make any claim whatsoever, or to take any proceedings under the said Section in respect of any non-compliance therewith, or under the Directors' Liability Act, 1890, in respect of any statement in the Prospectus made by the Directors or other persons liable in the belief that it was true.

In addition to the 3500 £1 Ordinary and 500 £1 Founders' Shares to be allotted to the Vendors as fully paid, it is only intended to call up this season 10s. per share on the remaining 8500 £1 Ordinary and 7000 £1 Preference and 500 £1 Founders'. Upon the total paid-up capital of £12,000, it will only need £1060 to pay the Preferential Dividends and 10 per cent. on the Ordinary and Founders' Shares, as follows:—

7000 £1 Six per cent. Preference	. . .	(10s. paid)	£3,500	. . £210
8500 £1 Ordinary	10 per cent.	(10s. paid)	4,250	. . 425
500 £1 Founders'	10 per cent.	(10s. paid)	250	. . 25
3500 £1 Ordinary fully-paid	10 per cent.		3,500	. . 350
500 £1 Founders' „	10 per cent.		500	. . 50
			£12,000	. . £1050

The Books of the Company have been audited from the commencement of the business by Mr. William Chadwick, and the profit during that period shows a return on the capital employed of over 10 per cent. per annum, after all management and other expenses have been paid.

The 12,000 £1 Shares of Preferential Capital is Preferential both as regards Capital and Dividend.

The Founders' Shares rank with the Ordinary for Capital and Dividend; but after 10 per cent. has been paid on the Ordinary and Founders' Shares, they take one-third of the remaining Profits.

Applicants for each and every 50 £1 Six per cent. Preference Shares will be entitled to apply for One Founders' Share at £1 each.

Applicants for each and every 50 £1 Ordinary Shares will be entitled to apply for Two Founders' Shares at £1 each.

Any Applicant for more than this proportion of Founders' Shares must apply for same at £2 each; the £1 premium being placed to the credit of the Company's Capital Account.

Applications for Shares should be made upon the forms accompanying the Prospectus, and forwarded to the Bankers of the Company, together with the amount payable on application. If no allotment is made, the deposit will be returned without deduction; and where the number of Shares allotted is less than the number applied for, the surplus will be credited in reduction of the amount payable on allotment.

Copies of the Prospectus with Forms of Application for Shares may be obtained at the Offices of the Company, or from their Bankers, Solicitors, or Auditor.

Copies of the Memorandum and Articles of Association of the Company, and of the Contracts above mentioned, may be inspected at the Offices of the Company's Solicitors at Hyde.

Cross Street, Hyde, 25th day of January, 1897.

CORPORATION OF COLNE.
(GAS DEPARTMENT.)

THE Gas Committee invite Tenders for IRONWORK required for Five SETTINGS complete, in Retort-House No. 2, comprising Stage Floor, Girders, &c.

Plans can be seen, and Specifications and Form of Tender obtained, at the Engineer's Office.

Tenders, endorsed "Ironwork," to be delivered to the undersigned on or before Saturday, the 20th day of February, 1897.

HY. SIMMONDS,
Engineer and General Manager.

Engineer's Office. Gas-Works,
Colne, Lancs., Feb. 2, 1897.

THE Corporation of Middleton are pre- pared to receive TENDERS for the TUBES and FITTINGS, WET and DRY METERS, VITRIOL, and LIME required at the Gas-Works during the ensuing Year, delivered at the Gas-Works, Middleton, free of carriage.

Tenders, addressed to the Chairman of the Gas Committee, to be delivered at my Office on or before Wednesday, the 17th inst., endorsed "Tender for Vitriol," "Lime," &c., as the case may be.

Further Particulars may be obtained from Mr. Duxbury, Gas Manager.

The Corporation do not bind themselves to accept the lowest or any tender.

FREDERICK ENTWISTLE,
Town Clerk.

Town Hall, Middleton,
near Manchester, Feb. 1, 1897.

BROMLEY GAS CONSUMERS' COMPANY.

NOTICE is Hereby Given, that the ORDINARY HALF-YEARLY GENERAL MEETING of this Company will be held at the Bell Hotel, Bromley, Kent, on Thursday, the 25th day of February inst., at Six o'clock p.m. precisely, to receive the Report of the Directors, the Balance-Sheet certified by the Auditors, to declare Dividends, and for General Purposes.

The TRANSFER BOOKS WILL BE CLOSED from the 11th to the 25th of February, 1897, both days inclusive.

By order of the Board,
HENRY W. AMOS,
Secretary.

Offices at the Works, Bromley,
Kent, Feb. 5, 1897.

MITCHAM AND WIMBLEDON DISTRICT GASLIGHT COMPANY.
(INCORPORATED BY ACT OF PARLIAMENT, 1867.)

NOTICE is Hereby Given, that the SIXTIETH ORDINARY HALF-YEARLY GENERAL MEETING of the Shareholders of this Company will be held in the Board-Room, at the Works, Mitcham, in the County of Surrey, on Tuesday, the 23rd day of February, 1897, at Three o'clock in the afternoon precisely, to receive the Report of the Directors and a Statement of the Accounts for the Half Year ended the 31st day of December last, to declare a Dividend, to elect Directors and an Auditor in place of those retiring by rotation, and for General Business.

The TRANSFER BOOKS WILL BE CLOSED from the 8th inst. until after the Meeting.

By order,
BENJAMIN GREEN,
Secretary and Manager.

Offices and Works: Western Road,
Mitcham, Feb. 9, 1897.

RIDDINGS DISTRICT GAS COMPANY.

NOTICE is Hereby Given, that the ORDINARY HALF-YEARLY MEETING of the Shareholders of the above Company will be held at the Offices of the Company, No. 30, Gracechurch Street, in the City of London, on Friday, the 26th day of February, 1897, at Half-past Three o'clock in the afternoon precisely, to receive the Report of the Directors and the Accounts for the Half Year ending the 31st day of December last, to declare a Dividend, to elect Directors and an Auditor in the place of those retiring by rotation, and to transact the General Business of the Company.

The TRANSFER BOOKS WILL BE CLOSED from the 13th to the 26th inst., both inclusive.

By order of the Board,
ALFRED LASS,
Secretary.

Offices: 30, Gracechurch Street,
London, Feb. 5, 1897.

COLNEY HATCH GAS COMPANY.

NOTICE is Hereby Given, that the ORDINARY HALF-YEARLY GENERAL MEETING of the Proprietors of this Company will be held at the Company's Offices, New Southgate, on Thursday, the 25th of February, at Five o'clock in the evening precisely, to receive the Report of the Directors, and the Accounts of the Company for the Half Year ended the 31st of December, 1896, to declare Dividends, to elect Directors, to appoint an Auditor, and for other purposes.

And Notice is Hereby further Given that, immediately after the conclusion of the Business of the above Meeting, an EXTRAORDINARY GENERAL MEETING of the Company will be held at the same place, for the purpose of considering, and, if thought fit, passing a Resolution to be submitted to the Meeting, empowering the Directors to convene future Ordinary General Meetings of the Company either in the months of (*a*) February or March, and (*b*) August or September, as to the Directors may appear from time to time expedient.

By order,
ERNEST L. BURTON,
Secretary.

5, Great Winchester Street,
London, E.C., Feb. 6, 1897.

ROBERT MARSHALL,

CANNEL COAL MERCHANT,

97, WELLINGTON STREET, GLASGOW.

Prices and Analysis of all the Scotch Cannels on Application.

CHELSEA WATER-WORKS COMPANY.

2¾ PER CENT. DEBENTURE STOCK.
MINIMUM PRICE: £98 PER CENT.
ISSUE OF AN AMOUNT TO REALIZE £50,000.

NOTICE is Hereby Given, that the Directors are prepared to receive TENDERS for the above ISSUE, being the whole of the amount created and authorized under the Chelsea Water-Works Act, 1896, bearing Interest at 2¾ per cent. per annum, and Redeemable after the expiration of 25 Years from the date of issue, subject to Six Months' Notice being given by the Company.

Minimum Price: £98 per cent.

Tenders must be delivered at the Company's Office, No. 41, Commercial Road, Pimlico, S.W., not later than Eleven a.m., on Thursday, the 25th of February next.

Particulars and Conditions of Sale, together with Forms of Tender, may be obtained at the said Office, or will be forwarded on application.

By order of the Court of Directors,
G. H. GILL,
Secretary.

41, Commercial Road, Pimlico,
Jan. 14, 1897.

ISSUE OF STOCKS AND SHARES BY AUCTION UNDER PARLIAMENTARY POWERS.

MR. ALFRED RICHARDS undertakes the issuing by Auction of GAS AND WATER SHARES under Parliamentary Powers.

He also holds MONTHLY SALES of GAS AND WATER SHARES at the Auction Mart, Tokenhouse Yard, E.C.

Terms for the issuing of Capital, and also for offering to auction Gas and Water Shares, and all Particulars relating thereto, may be had of Mr. Alfred Richards.

Offices: 18, FINSBURY CIRCUS, E.C.

By order of the Directors of the Lowestoft Water, Gas, and Market Company, the Administrator of H. F. Palmer, Esq., deceased, and other Owners.

GAS AND WATER STOCKS AND SHARES IN THE
Lowestoft Water, Gas, and Market Company.
Tottenham and Edmonton Gas and Coke Company.
West Ham Gas Company.
Barnet District Gas and Water Company.
South-West Suburban Water Company.
Ilford Gas Company, Tunbridge Wells Gas Company, Crays Gas Company, and West Kent Gas Company.

MR. ALFRED RICHARDS will Sell the above BY AUCTION, at the Mart, E.C., on Tuesday, March 2, at Two o'clock.

Particulars of the AUCTIONEER, 18, FINSBURY CIRCUS, E.C.

By order of the Directors.

TOTTENHAM AND EDMONTON GASLIGHT AND COKE COMPANY.
(INCORPORATED BY ACT OF PARLIAMENT, 1859.)

SALE OF £15,000 STOCK.

MR. ALFRED RICHARDS is instructed to SELL BY AUCTION at the Mart, Tokenhouse Yard, E.C., on Tuesday, the 9th of March, 1897, at Two o'clock, in Lots of £100 and £50 each,

£15,000 OF "C" STOCK,

ranking for a Standard Dividend of 7 per cent., subject to the Sliding-Scale (the last Dividend on similar Stock having been at the rate of 8½ per cent.), and issued pursuant to the Company's Act of 1882.

Particulars may be obtained at the COMPANY'S OFFICES, Willoughby Lane, TOTTENHAM; of Messrs. MERRIMAN, PIKE, and MERRIMAN, Solicitors, 25, Austin Friars, E.C.; and of the AUCTIONEER, 18, FINSBURY CIRCUS, E.C., and 816, High Road, TOTTENHAM.

By Order of the Directors.

IMPORTANT ISSUE OF £10,000 STOCK OF THE BRIGHTON AND HOVE GENERAL GAS COMPANY.

MR. ALFRED RICHARDS will Sell by AUCTION, at the Mart, E.C., on Wednesday Feb. 10, at Two precisely, in lots of £100 each,

£10,000 OF "A" ORDINARY STOCK
OF THE
BRIGHTON AND HOVE GENERAL GAS COMPANY,

ranking for a Standard Dividend of 7 per cent., subject to the Sliding Scale; the last Dividend on the Company's "A" Stock having been 8½ per cent. per annum.

Particulars of the SECRETARY of the Company, at No. 5, GREAT WINCHESTER STREET, E.C., and 77, West Street, BRIGHTON; of Messrs. HOWLETT AND CLARKE, of 8, Ship Street, BRIGHTON, Solicitors to the Company; of Mr. RALPH HOMAN, Stock and Share Broker, 2, Austin Friars, LONDON, E.C.; and of the AUCTIONEER, 18, FINSBURY CIRCUS, E.C.

JAMES OAKES & Co.,

ALFRETON IRON-WORKS, DERBYSHIRE,
AND
Wenlock Iron Wharf, 21 & 22, Wharf Road, CITY ROAD, LONDON, N.,

Manufacture and keep in Stock at their Works (also large stock in London)

PIPES and CONNECTIONS, 1½ to 48 inches in diameter, and make and erect to order RETORTS, PURIFIERS and TANKS, with or without planed joints, COLUMNS, GIRDERS, SPECIAL CASTINGS, &c., required by Gas, Water, Railway, Telegraph, Chemical, Colliery, and other Companies.

NOTE.—Makers of HORSLEY'S PATENT SYPHONS. These are cast in one piece, without Chaplets; doing away with bolts, nuts and covers, and rendering leakage impossible.

TOTTENHAM AND EDMONTON GASLIGHT AND COKE COMPANY.

NOTICE is Hereby Given, that the HALF-YEARLY ORDINARY GENERAL MEETING of the Proprietors of this Company will be held at the Company's Offices, Willoughby Lane, Tottenham, on Saturday, the 27th day of February inst., at Half-past Three o'clock in the afternoon precisely, to receive the Report of the Directors, the Statement of Accounts for the Half Year ended the 31st day of December, 1896, to declare a Dividend, and transact such other Business as the Act of Parliament directs.

The TRANSFER BOOKS WILL BE CLOSED from Saturday, the 13th inst., until Monday, the 1st day of March next.

By order of the Board of Directors,
JAMES RANDALL,
Secretary.

Offices of the Company:
Willoughby Lane, Tottenham,
Feb. 5, 1897.

THE TOTTENHAM AND EDMONTON GASLIGHT AND COKE COMPANY.

NOTICE is Hereby Given, that the Directors of the above Company intend to OFFER FOR SALE by PUBLIC AUCTION, at the Mart, Tokenhouse Yard, in the City of London, on Tuesday, the 9th day of March next, at Two o'clock in the afternoon precisely, £15,000 (being fourth portion) of "C" STOCK, in the following Lots: 100 of £100 each, and 100 of £50 each, issued under the Powers of the Tottenham and Edmonton Gas Act, 1882.

By order,
JAMES RANDALL,
Secretary.

Dated this 29th day of January, 1897.

NEWCASTLE-UPON-TYNE AND GATESHEAD GAS COMPANY.

SALE OF DEBENTURE STOCK.

THE Directors have instructed Mr. ROBERT MACK, Auctioneer, to SELL BY AUCTION, at the Offices of the Company, Grainger Street West, Newcastle-upon-Tyne, on Wednesday, the 24th day of February, 1897, at Half-past Twelve o'clock precisely, £45,000 of the NEWCASTLE-UPON-TYNE AND GATESHEAD GAS DEBENTURE STOCK, bearing Interest at 3½ per cent. per annum, payable Half Yearly on the 1st of January and the 1st of July, being part of the moneys authorized to be raised by the Newcastle-upon-Tyne and Gateshead Gas Act, 1896.

For Conditions of Sale and further Particulars, apply to the undersigned.

THOS. WADDOM,
Secretary.

Gas Office, Newcastle-upon-Tyne,
Jan. 26, 1897.

HOLMSIDE GAS COALS.

PRESENT DAILY PRODUCE OVER 4000 TONS.

LATEST ANALYSIS—By CHARLES PHILLIPS, Gas Examiner to Rotherham Corporation.

Yield of Gas Per Ton . . 11,205 Cubic Feet.
Illuminating Power, 16 7/10 Stand. Sperm. Candl.
Coke (of good & pure quality) 13¾ Cwt. Per Ton.
Sulphur . . . . A little over 1 Per Cent.
Ash . . . . . Under 1 Per Cent.
Tar . . . . . 163 Lbs. (Avoir.) Per Ton.
Ammoniacal Liquor 103 Lbs. (Avoir.) Per Ton.

HOLMSIDE GAS COALS are supplied to the largest Gas Companies in England and on the European Continent; London alone consuming about half the produce.

SOUTH MOOR PELTON GAS COALS.

PRESENT DAILY PRODUCE AVAILABLE 2500 TONS.

RESULTS OF DIFFERENT ANALYSES:—

Yield of Gas Per Ton . . 10,500 Cubic Feet.
Illuminating Power . 17 Stand. Sperm Candl.
Coke (of excellent quality) . 13½ Cwt. Per Ton.
Sulphur . . . . . 1·13 Per Cent.
Ash. . . . . 1·34 Per Cent.
Tar. . . . . 180 Lbs. (Avoir.) Per Ton.
Ammoniacal Liquor 94½ Lbs. (Avoir.) Per Ton.

The HOLMSIDE and SOUTH MOOR COALFIELD possesses *a very great quantity of the best Coal;* and, whilst other Coal-Fields are becoming exhausted, this one is only being opened out, so that *the quality* of both the HOLMSIDE COALS, and the SOUTH MOOR COALS *may be relied upon for all practical purposes.*

These Coals may be bought through the Principal Merchants in England, or direct from

MR. MARK ARCHER,

HOLMSIDE AND SOUTH MOOR OFFICES,

NEWCASTLE-UPON-TYNE.

THE INCANDESCENT GAS-LIGHT COMPANY, LIMITED,
— *v* —
"DE MARE" COMPANY.

THE INCANDESCENT GAS-LIGHT COMPANY, LIMITED.
— *v.* —
"SUNLIGHT" COMPANY.

THE INCANDESCENT GAS-LIGHT COMPANY, LIMITED, HEREBY GIVE NOTICE, as follows:—

VALIDITY. The Company's Patent has been declared VALID ON ALL POINTS after a Fifteen-Day Trial.

NATURE OF INVENTION. The Invention was described by Mr. Justice Wills as a "PIONEER INVENTION."

SCOPE OF PATENT. The Patent HAS BEEN GIVEN A WIDE CONSTRUCTION; and it was held that the protection given by it was not confined to Mantles manufactured according to the particular prescriptions set out in the Specification.

SHAPE OF MANTLE. The Judge held that a Mantle, even if made in a different form or shape (such as the "De Mare" Fringe or Plume), IS STILL AN INFRINGEMENT of the "Welsbach" Patent.

"DE MARE" JUDGMENT. Judgment for an INJUNCTION, WITH FULL COSTS, has been given against the "De Mare" Incandescent Gas-Light System.

"SUNLIGHT" JUDGMENT. Judgment was given AGAINST the "Sunlight" Incandescent Gas-Lamp Company, Limited, on the question of the VALIDITY OF THE PLAINTIFFS' PATENT.

"SUNLIGHT" MANTLES. Last about 100 hours.

"WELSBACH" MANTLES. Last about 1000 hours.

"Sunlight" Mantles BURN DOUBLE THE GAS to produce the same candle power as the Incandescent Gas-Light Company's Mantles.

Users of "Sunlight" Mantles are applying to the Incandescent Gas-Light Company to REPLACE THEM BY THEIR OWN MANTLES.

WARNING. Users of the Incandescent Gas-Light Company's Mantles upon "Sunlight" Burners ARE INFRINGERS OF THE COMPANY'S PATENT, AND WILL BE AT ONCE PROCEEDED AGAINST.

COSTS. Certificates of the Validity of the Company's Patent have been granted both by Mr. Justice Romer and Mr. Justice Wills entitling the Company to Solicitor and Client Costs, which will, IN ALL CASES, BE RIGOROUSLY ENFORCED.

INFRINGERS. The Incandescent Gas-Light Company WILL TAKE PROCEEDINGS AGAINST ALL PERSONS INFRINGING THEIR PATENT WHETHER
MAKERS,
WHOLESALE DEALERS,
RETAILERS,
or
USERS.

Users of the Company's Mantles upon Burners not sold by the Company ARE INFRINGERS.

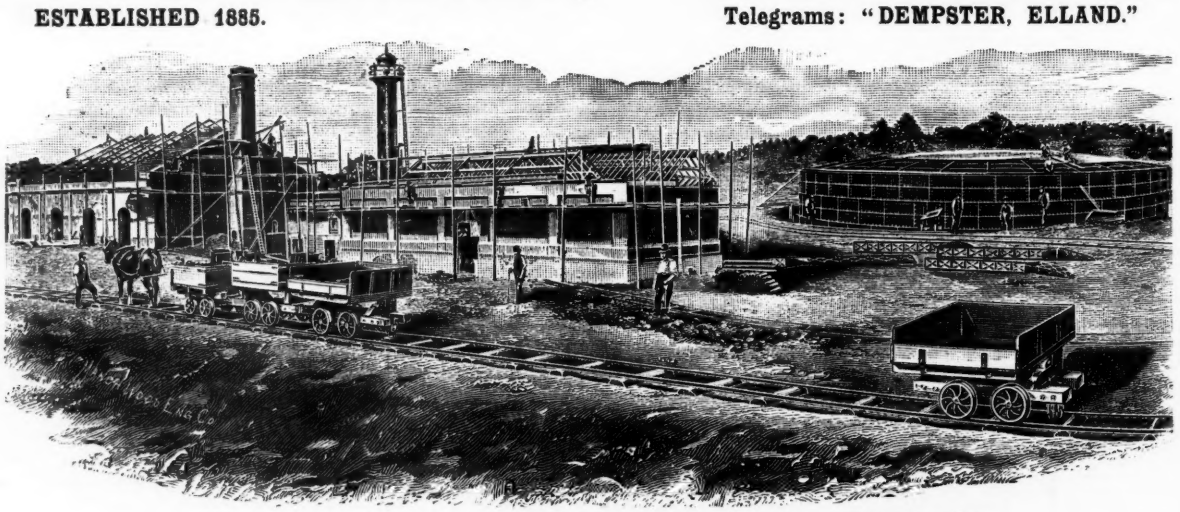
"LIMITED LICENSE" WARNING. Judgments have already been obtained against such users from Mr. Justice Chitty, Mr. Justice Stirling, Mr. Justice Kekewich, and Mr. Justice North.

FAITHFULL & OWEN,
11, Victoria Street,
Westminster.
Solicitors to the Incandescent Gas Light Company, Limited.

April, 1896.

R. DEMPSTER & SONS,
LIMITED,
GAS ENGINEERS and CONTRACTORS,
ELLAND, YORKS.

ESTABLISHED 1885. Telegrams: "DEMPSTER, ELLAND."



Engraved from Photograph of Complete Gas-Works in course of Construction.

The WHOLE of the Apparatus, Foundations, Retort Work, Buildings, and Levelling of Site have been executed by our own Workmen. No Sub-Contracts.

Estimates and Illustrations for complete Works, or for any detailed parts, supplied gratis on application.
Tenders given for all kinds of Structural Ironwork.

HEBBURN MAIN GAS COALS.

Yield of Gas per ton . . . . . 10,500 cub. ft.
Illuminating Power . . . . . 16·4 candles.
Coke . . . . . 68 per cent.

For Prices, f.o.b. Ship or Delivered by Rail, apply to

THE WALLSEND & HEBBURN COAL COMPANY, LTD.
8 Lombard Street,
NEWCASTLE-ON-TYNE.

W. RICHARDSON, Fitter.

COKE-BREAKERS,

PRICES REDUCED.

(THOMAS & SOMERVILLE'S PATENT)

New Design, with two Cutting Rollers, making less Breeze than their old pattern.

GEORGE WALLER & CO.,
165, QUEEN VICTORIA STREET, E.C.,
And at STROUD, GLOUCESTERSHIRE.

THE SILICA FIRE-BRICK COMPANY,

OUGHTIBRIDGE, near SHEFFIELD,

MANUFACTURE

SILICA BLOCKS, BRICKS, AND CEMENT

OF SUPERIOR QUALITY

FOR GAS-FURNACES.

Trade Mark: "SILICA."

These Goods (largely used in Gas, Glass, Iron, and Steel Works) are, on account of their

GREATER DURABILITY,

Strongly recommended where EXCESSIVE HEATS have to be maintained.

THE "COOMBE" DRAUGHT SCREEN FOR INCANDESCENT BURNERS.

For Illustration and Statement of Advantages to be gained by its use, see "JOURNAL," Feb. 2, p. 214.

ALFRED ARCULUS & CO., Glass Manufacturers,
BIRMINGHAM.

BOLDON GAS COALS.

Worked by THE HARTON COAL CO., LTD.

Output about 3000 tons per day.

ANALYSIS—

Yield of Gas per ton .	10,500	Cubic Feet.
Illuminating Power . .	16·9	Candles.
Coke	66·7	Coke.
Sulphur	0·86	Sulphur.
Ash	2·04	Ash.

Boldon Gas Coals are supplied under contract to

The Gaslight and Coke Company, South Metropolitan Gas Company, Commercial Gas Company, Imperial Continental Gas Association, European Gas Company, L'Union des Gaz (the Continental Union Gas Company), Crystal Palace District Gas Company, Danish Gas Company, Bombay Gas Company, San Paulo Gas Company, Alliance and Dublin Consumers' Gas Company, Ipswich Gaslight Company, Newcastle Gas Company, Sunderland Gas Company, South Shields Gas Company, and to many other Companies at Home and Abroad.

For Prices, &c., apply to the

HARTON COAL COMPANY, LIMITED,
Newcastle-on-Tyne.
W. H. PARKINSON, Fitter.

Awarded HIGHEST MEDAL and DIPLOMA at the Newcastle-on-Tyne Royal Mining and Industrial Exhibition, 1887, for

CANNEL & COAL.

TYNE

BOGHEAD CANNEL.

Yield of Gas per ton	13,155 cub. ft.
Illuminating Power	38·22 candles.
Coke per ton	1,301·88 lbs.

EAST PONTOP GAS COAL.

Yield of Gas per ton	10,500 cub. ft.
Illuminating Power	17·8 candles.
Coke	70 per cent.

SOUTH PELAW MAIN GAS COAL.

Yield of Gas per ton	10,500 cub. ft.
Illuminating Power	16·3 candles.
Coke	73·1 per cent.

For Prices and complete Analysis, apply to

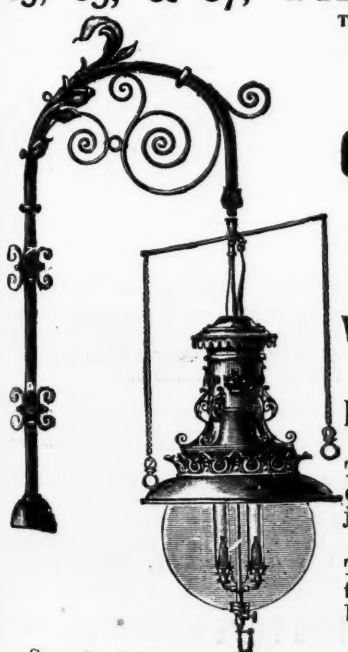
THOS. W. DANCE & SONS,
COAL OWNERS, NEWCASTLE-ON-TYNE;
OR
E. FOSTER & CO.,
21, JOHN STREET, ADELPHI, LONDON, W.C.

FALK, STADELMANN, & CO., LD.,

VERITAS LAMP WORKS,

83, 85, & 87, FARRINGDON ROAD, LONDON, E.C.

Telegraphic Address: "Lamps, London." Telephone No. 6707.



Swan Neck Pendant **No. 42,281** with Lantern **No. 42,271.**

THE "VERITAS" GAS ARC LANTERNS

(PROTECTED BY ROYAL LETTERS PATENT)

SPECIALLY CONSTRUCTED FOR THE

Incandescent System of Gas Lighting.

Wind, Rain, and Dust Proof.

Enamelled Steel throughout.

Made for One, Two, Three, and Five Lights.

The undisputed great advantages of the **Incandescent System of Gas Lighting** are frequently prejudiced by atmospheric influences upon the Mantles or by sudden gusts of wind.

These deficiencies have been entirely overcome by the construction of our "VERITAS" GAS ARC LANTERN, which differs from others, and which we are confident is the best yet offered.

Each Lantern complete; nothing to get out of order; and no skill is required in fixing.

Managers of Gas Companies will do well to apply for Descriptive Catalogue GRATIS.

(Wholesale only.)

No. 42,265.

TROTTER, HAINES, & CORBETT,

Brettell's Estate

FIRE-CLAY & BRICK WORKS,

STOURBRIDGE.

Manufacturers of GAS-RETORTS, GLASSHOUSE FURNACE & BLAST-FURNACE BRICKS, LUMPS, TILES, and every description of FIRE-BRICKS.

Proprietors of

BEST GLASSHOUSE POT & CRUCIBLE CLAY.

Shipments Promptly and Carefully Executed.

London Office: R. Cull, 84, Old Broad St., E.C.

NEWBATTLE CANNEL.

Highest Results in Gas, & Excellent Coke.

QUOTATIONS ON APPLICATION TO

THE LOTHIAN COAL COMPANY,

LIMITED,

NEWBATTLE COLLIERIES,

DALKEITH, N.B.

UNEQUALLED.

Gas Companies are solicited to try Samples of the

MIRFIELD

BLACK BED GAS COAL.

Prices and Analysis on application.

MIRFIELD (GAS-COAL) COLLIERY COMPY.

RAVENSTHORPE, near DEWSBURY.

WATERBLEAN PAINT

Telegrams:

"EVESON, BIRMINGHAM."

THORNLEY GAS COALS

WORKED BY THE

WEARDALE IRON & COAL Co., Ld.

OUT OF THEIR

THORNLEY AND WHEATLEY HILL COLLIERIES.

Analysis made by

Messrs. J. & H. S. PATTINSON, *May 28, 1895.*

Yield of Gas per Ton . .	10,500 Cub. Ft.
Illuminating Power . .	16·9 Candles.
Coke (of good quality) . .	67·5 per Cent.
Sulphur	0·58 „
Ash	2·73 „

For Price, &c., apply to the

WEARDALE IRON & COAL Co., Ld.

QUAYSIDE, NEWCASTLE-ON-TYNE.

LONDONDERRY GAS COALS

FROM THE

MARQUIS OF LONDONDERRY'S COLLIERIES,

COUNTY OF DURHAM.

Available output up to 5000 tons per day.
Yield of Gas 11,000 cubic feet per ton of Coal as per analysis by
Mr. John Pattinson, F.C.S., F.I.S.

For Prices and Particulars, apply to

S. J. DITCHFIELD,

SEAHAM HARBOUR, COUNTY OF DURHAM.

THOMAS TURTON AND SONS, Limited,

SHEAF WORKS, SHEFFIELD,

MANUFACTURERS OF

FILES OF BEST QUALITY

FOR ENGINEERS.

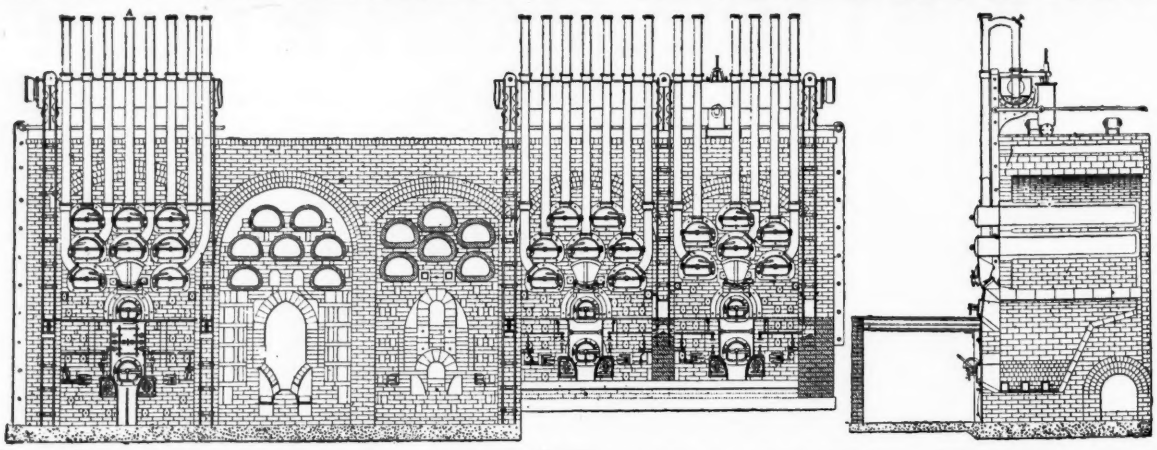
STEEL OF ALL DESCRIPTIONS.

SCREW STOCKS, TAPS AND DIES,
SPANNERS, RATCHET BRACES, LIFTING JACKS,
ANVILS, VICES,
AND ENGINEERS' TOOLS GENERALLY.

London Office:

90, CANNON STREET, E.C.

HISLOP'S PATENT REGENERATIVE SETTINGS OF GAS-RETORTS.



THESE SETTINGS ARE POSITIVELY UNRIVALLED IN PRODUCTIVE CAPACITY, DURABILITY, AND SIMPLICITY OF MANAGEMENT. RETORTS OF ORDINARY DIMENSIONS CARBONIZING FROM 18 TO 24 CWT. OF ENGLISH AND 21 TO 26 CWT. OF SCOTCH COAL PER 24 HOURS, DEPENDING UPON THE NATURE OF THE COAL, AND PRODUCING UP TO FULLY 13,000 CUBIC FEET PER MOUTHPIECE IN THE SAME TIME, AND WITH THE SMALLEST EXPENDITURE OF FUEL ATTAINABLE, AND RETURNING IN PROFIT THE ENTIRE COST OF ERECTION WITHIN TWELVE TO EIGHTEEN MONTHS; AND THUS REDUCING TO INSIGNIFICANCE THE INCREASED COST OF THESE SETTINGS OVER THE COMMON OR GENERATOR FURNACE SYSTEMS.

THESE SETTINGS ARE EXTENSIVELY ADOPTED, AND ARE ERECTED UPON THE SHALLOW AND STAGE FLOOR PLANS. THEY ARE ADAPTED TO ANY EXISTING ARRANGEMENTS, AND PERFECT SATISFACTION GUARANTEED. THE COMPOSITION OF FIRE-RESISTING AND OTHER SPECIAL FIRE-CLAY MATERIALS FURNISHED IS OF THE HIGHEST ORDER: AND THE SYSTEM AS A WHOLE, AS NOW PERFECTED, IS THE RESULT OF LONG EXPERIENCE AND CAREFUL STUDY OF THE PRINCIPLES OF GASEOUS FIRING.

Drawings and Tenders are furnished for the complete erection of Benches, including Retort and Bench Mounting of the most modern and approved description; or existing Ovens fitted up with the Patentee's arrangements.

Full Particulars may be had on application to the Patentee's Agents: **Messrs. JONAS DRAKE AND SON**, Retort Setters and General Carbonizing Engineers, Ovenden, Halifax, Yorkshire, Sole Agents for England, Wales, and Foreign Countries; **C. M. HAMILTON**, Retort Setter and Contractor, 5, Stuart Street, Shawlands, Glasgow, Agent for Scotland and Ireland; and to the Principal Agent, **R. F. HISLOP** (Son of Patentee), General Constructing and Carbonizing Engineer, Gas-Works, Paisley, N.B.

HISLOP'S PATENT HYDRAULIC MAIN SEAL-REGULATING AND TAR-EXTRACTING VALVE is a *Sine qua non* TO THE SATISFACTORY WORKING OF THE HYDRAULIC MAIN UNDER THE REGENERATIVE AS WELL AS OTHER SYSTEMS OF RETORTS. BEING LARGELY ADOPTED AND AFFORDING THE HIGHEST SATISFACTION.

The Patentee's SELF-SEALING CAPS FOR THE TOP OF ASCENSION-PIPES, and his "SPECIAL" FLUE PORT BOXES, are most important additions to his Carbonizing Plant.

SPENT LIMES NO LONGER WASTE PRODUCTS.

Under G. R. HISLOP'S Patents, all Spent Limes are effectively recovered at from one-third to one-half the cost of New Lime.
Further Information and Pamphlets from Principal Agent.

THE NEW INCANDESCENT (SUNLIGHT PATENT) GAS LIGHTING COMPANY, LIMITED.

THE SUNLIGHT COMPANY having finally beaten the Welsbach Company in the Law Courts, notwithstanding the misleading statements which are being advertised, the Legal Position of its Mantle is now

ESTABLISHED BEYOND ALL QUESTION.

Mr. JUSTICE WILLS says in his Judgment: "No use is made by the Defendants (the Sunlight Company) of any of the rare earths; and their choice of substances, and their method of applying the illuminants, appear to me to be as wide asunder as the poles from those contemplated by Welsbach."

Therefore any interference with our Customers by the Incandescent Company in the use of our Mantles, either on our Burners *or on theirs*, should be promptly reported. **It will at once be summarily dealt with by us, without cost to our Customers.**

THE SUNLIGHT MANTLE gives a

SOFT MELLOW LIGHT, VERY

AGREEABLE TO THE EYESIGHT, AND HEIGHTENS THE

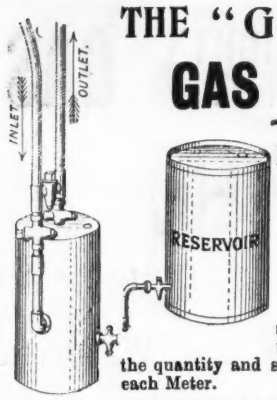
DECORATIVE EFFECT OF PLEASANT COLOURS.

WE ARE PREPARED TO *MAINTAIN ALL BURNERS* FITTED BY OURSELVES AT A VERY LOW PRICE PER ANNUM;

AND *SPECIAL TERMS* FOR *RENEWAL MANTLES* WILL ALSO BE MADE TO THOSE WHO PREFER TO DO SO THEMSELVES.

THE NEW INCANDESCENT (SUNLIGHT PATENT) GAS LIGHTING COMPANY, LIMITED,

33 & 34, SHOE LANE, LONDON, E.C.



THE "GLOBE" PATENT

GAS ENRICHER.

IMPROVED LIGHT AND REDUCED GAS BILLS.

ESTIMATES AND TERMS ON APPLICATION.

When writing for Estimates, please state number of Meters in use, with the diameter of the Outlet-Pipe. Also the quantity and sizes of the ordinary Burners served by each Meter.

GLOBE GAS ENRICHER SYNDICATE, LTD.,
81, HIGH HOLBORN, LONDON, W.C.

INCANDESCENT GAS LIGHTING

SMOKELESS GLOBE-CHIMNEY.

CONSUMES ITS OWN SMOKE, AND INCREASES THE LIFE OF MANTLES.

No Chimney Required.

Prices 2s. 6d. to 4s. 0d.
List on Application.

J. ORMEROD,
81, HIGH HOLBORN, LONDON, W.C.

PETTIGREW'S PATENT

Sulphate of Ammonia Plant

ON THE CONTINUOUS SYSTEM

Is the newest in the Market, and is the outcome of practical experience in Sulphate Making.

Old Systems easily and cheaply converted.

ANY SIZE ERECTED COMPLETE AT HOME OR ABROAD.

Write for Particulars, Testimonials, and References to

GEO. PETTIGREW & Co.,
GAS AND CHEMICAL ENGINEERS,
MIDDLESBROUGH-ON-TEES.

ARROL-FOULIS
Patent Automatic Machinery
FOR
DRAWING AND CHARGING GAS-RETORTS.

Full Particulars may be obtained from the Sole Makers,

SIR WILLIAM ARROL & CO., Limited,
GLASGOW.

[See Illustrated Advertisement, Feb. 2, p. 262.]

JOHN BROWN & CO., LTD., SHEFFIELD.

Proprietors of

ALDWARKE MAIN, CAR HOUSE & ROTHERHAM MAIN COLLIERIES, NEAR ROTHERHAM.

ALDWARKE MAIN GAS COAL

Analysis: 12,600 Feet of 19-Candle Gas per Ton.

Value in Pounds of Sperm, 820·80.

VERY FREE FROM IMPURITIES.

TELEGRAMS: "ATLAS, SHEFFIELD."

MOBBERLEY & PERRY
STOURBRIDGE.

Manufacture & supply best quality of

Gas Retorts (SEGMENTAL, HORIZONTAL, or INCLINED.)

Special Bricks & Blocks for GENERATOR & REGENERATOR FURNACES.

FIRE BRICKS, LUMPS, & TILES, BLUE STAFFORDSHIRE VITRIFIED BRICKS FOR PAVING, &c. &c.

EVERY REQUISITE FOR GAS-WORKS. Retort Setters sent to any part of the Kingdom.

Contractors for the erection of Retort-Benches complete.

London Agents:
BALE & HARDY, Gas Engineers and Contractors,
BRIDGE HOUSE, 181, QUEEN VICTORIA STREET, E.C.

ALEX. C. HUMPHREYS, M.Inst.C.E. A. G. GLASGOW, M.E.

MESSRS. HUMPHREYS & GLASGOW

Have constructed their EUROPEAN type of

CARBURETTED WATER-GAS PLANT

At the following Gas-Works:—

Copenhagen	700,000 Cub. Ft.	Preston	1,500,000 Cub. Ft.
Belfast	1,700,000 ,,	Southport	750,000 ,,
Belfast (Second Contract)	4,500,000 ,,	Bath	1,000,000 ,,
Glasgow	300,000 ,,	New York	1,200,000 ,,
Brussels	700,000 ,,	Newburgh, N.Y.	350,000 ,,
Brussels (Second Contract)	700,000 ,,	St. Joseph, Mo.	750,000 ,,
Liverpool	3,500,000 ,,	Winchester	200,000 ,,
Tottenham	750,000 ,,	Hoylake	125,000 ,,
Tottenham (Second Contract)	750,000 ,,	Shanghai	225,000 ,,
Santiago	400,000 ,,	Holyoke, Mass.	600,000 ,,
Swansea	750,000 ,,	Stockport	500,000 ,,
Brighton	1,500,000 ,,		

And have now under Contract:—

Manchester	3,000,000 Cub. Ft.	Bordentown, N.J.	125,000 Cub. Ft.
Edinburgh	2,000,000 ,,	Lea Bridge	350,000 ,,
Stockton-on-Tees	500,000 ,,	Newburgh, N.Y. (Second Contract)	250,000 ,,
Norwich	1,000,000 ,,	Coventry	600,000 ,,
Guildford	350,000 ,,	Brentford	1,100,000 ,,
Syracuse, N.Y.	850,000 ,,		

In addition to which the previous Installations of The Gaslight and Coke Company under this System have a total capacity of 10,000,000 cubic feet per diem.

9, Victoria Street, London, S.W. Telegrams: "EPISTOLARY, LONDON." *United States Office, 64, Broadway, New York.*

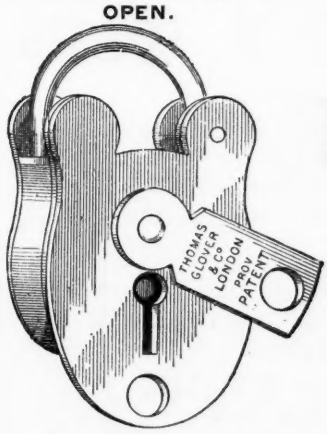
[ESTABLISHED 1844.] **ORIGINAL MAKERS.** [ESTABLISHED 1844.]

LONDON, 1851. NEW YORK, 1853. PARIS, 1855. LONDON, 1862. DUBLIN, 1865. PARIS, 1867.

THE SIX MEDALS AWARDED TO THOMAS GLOVER'S PATENT DRY GAS-METERS;

The latter being the Highest Award for Dry Gas-Meters at the Paris Exhibition, 1867. Since then we have not Exhibited FOR PRIZES.

OPEN.



THOMAS GLOVER & CO.'S

PATENT

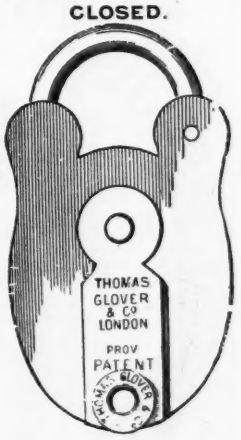
SECURE PADLOCK

Prevents Tampering with the

CASH-BOXES OF PREPAYMENT METERS.

The Padlock is Sealed by means of a Lead Eyelet, which is impressed with Company's private mark.
Eyelets easily fixed and removed by Company's Collector.

CLOSED.



Telegraphic Address: "GOTHIC LONDON." Telephone No. 6725.

THOMAS GLOVER & CO., LTD.,

DRY GAS-METER MANUFACTURERS,

214 to 222, ST. JOHN ST., CLERKENWELL GREEN, LONDON, E.C.

BRISTOL: 62, VICTORIA STREET. *Telegraphic Address: "GOTHIC."*

BIRMINGHAM: 1, OOZELLS STREET. *Telegraphic Address: "GOTHIC."*

MANCHESTER: 37, BLACKFRIARS STREET. *Telegraphic Address: "GOTHIC."*

BOWENS' Ltd. Successors,
STOURBRIDGE.

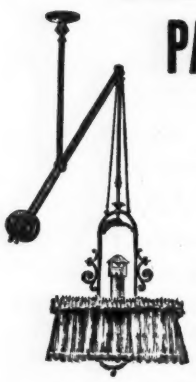
MANUFACTURERS OF
BEST FIRE-BRICKS; INCLINED, HORIZONTAL, and SECTIONAL RETORTS; LUMPS, TILES, &c., of every description.

Established 1860.

STOURBRIDGE
RETORTS AND FIRE-BRICKS.
BEST QUALITY.

KING BROTHERS, STOURBRIDGE.
[See Illustrated Advertisement, Feb. 2, p. 259.]

BEST & LLOYD
MAKERS OF THE **BIRMINGHAM.**

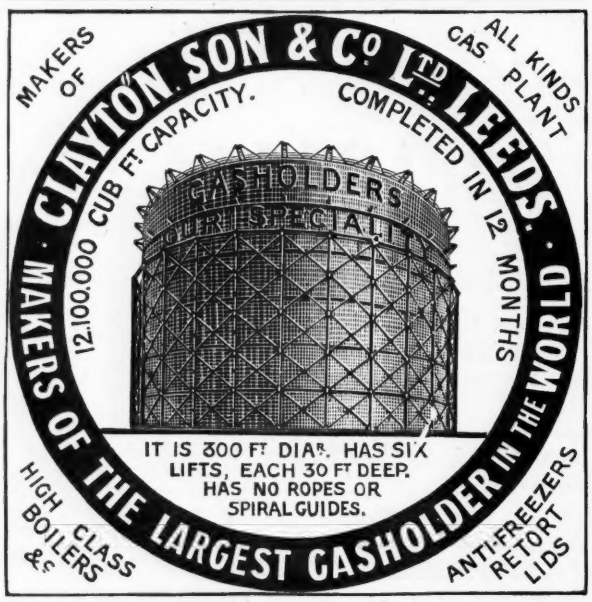


PATENT "SURPRISE" PENDANT,
WITH PATENT SHADE.

The ONLY GAS-PENDANT suitable for Domestic Lighting; a room 18 ft. by 14 ft. being beautifully illuminated with one Incandescent Burner.

Extract from the JOURNAL OF GAS LIGHTING, Jan. 8, 1895.

"IN CONJUNCTION WITH
THE INCANDESCENT GAS-LIGHT,
it quite **supersedes** the familar three-light pendent. We are able to bear witness to the **convenience** of the New Pendant."


MAKERS OF
CLAYTON, SON & Co LTD LEEDS.
ALL KINDS GAS PLANT
12,100,000 CUB FT CAPACITY.
COMPLETED IN 12 MONTHS
GASHOLDERS
SPECIALITY
IT IS 300 FT DIAR. HAS SIX LIFTS, EACH 30 FT DEEP. HAS NO ROPES OR SPIRAL GUIDES.
MAKERS OF THE LARGEST GASHOLDER IN THE WORLD
HIGH CLASS BOILERS &c
ANTI-FREEZERS RETORT LIDS

GIRDERS, ROOFS, & ALL KINDS OF STRUCTURAL IRONWORK.

London Office: 60, QUEEN VICTORIA STREET, E.C.
Telegraphic Addresses: "GAS, LEEDS," "ECLARAGE, LONDON."

HARPER & MOORES,
STOURBRIDGE.

MANUFACTURERS OF
BEST FIRE-BRICKS, GAS-RETORTS,
LUMPS, TILES, AND ALL ARTICLES IN FIRE-CLAY.
Proprietors of Best Glasshouse Pot, Crucible, and other Stourbridge Clays.

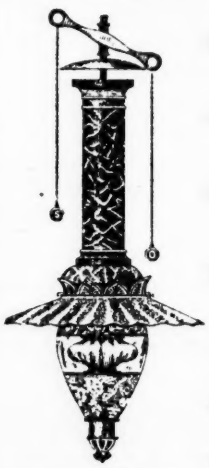
MANUFACTURERS OF GLASSHOUSE POTS AND CRUCIBLES OF EVERY KIND.
ESTABLISHED 1836.

WILLIAM INGHAM & SONS,
Incorporated with the Leeds Fire-Clay Company, Ltd.,

WORTLEY FIRE-CLAY WORKS,
Near LEEDS,
Have confidence in drawing the special attention of GAS ENGINEERS to the following advantages of their Retorts:—
1. Smooth interior, preventing adhesion of Carbon.
2. They can be made in one piece up to 10 feet long.
3. Uniformity in thickness, ensuring equal Expansion and Contraction.

PATENT
MACHINE-MADE GAS-RETORTS.

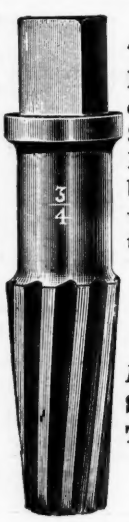
The Climax of Regenerative Gas Lighting!!



THE
"VERTMARCHE"
A 280-CANDLE POWER
PLAIN IRON LAMP,
CLASS A— 55/-
LIGHT for LIGHT
less than half the price of any other Regenerative Lamp.
Manufactured in England.

HENRY GREENE & SONS,
153 & 155, CANNON STREET, LONDON BRIDGE, E.C.
PARTICULARS AND PRICES FREE. AGENTS WANTED.

PATENT TWISTED TAPER
RYMERS & TAPS.



These **Patent Twisted Taper Rymers and Taps** are the best ever made for Gas and Water Service Connections. A true Hole and a correct Thread can be assured. They are easy to work, and will last much longer than straight grooved Taps and Rymers.

THOUSANDS ARE IN DAILY USE.

Also SCREWING-MACHINES, STOCKS and DIES (with Patent Twisted Dies), PIPE-TONGS, and other TOOLS.

Apply for Prices and Particulars to
JOHN RUSCOE,
ALBION WORKS, HYDE, near MANCHESTER.

OXIDE OF IRON.

NATURAL BOG ORE FROM OWN MINES.

Samples and Prices on application.

Wm. H. MÜLLER & CO.,

81, PALMERSTON BUILDINGS, LONDON, E.C.

TRADE MARK: "Compascum." Telegraphic Address: "FERRUM."

JOSEPH CLIFF & SONS,

INCORPORATED IN

THE LEEDS FIRE-CLAY COMPANY, Ltd.

WORTLEY, LEEDS.

LONDON OFFICES & DEPÔTS:

Baltic Wharf, Waterloo Bridge.

WHARVES NOS. 2 & 4, INSIDE G.N. GOODS YARD, KING'S CROSS, N.

LIVERPOOL:

16, Lightbody Street.

LEEDS:

Queen Street.

MACHINE-MADE RETORTS

Have been made in large quantities for the last twelve years; and during the whole of that time, have been in regular use at most of the largest Gas-Works in the Kingdom. They possess the excellent quality of remaining as near stationary as possible under the varying conditions of their work—a quality which will be appreciated by all Gas Engineers and Managers. The generally expressed opinion is that these Retorts are the very best that are made.

RETORTS CAREFULLY PACKED FOR EXPORT.

Fire-Bricks, Lumps, Tiles, &c., &c., of every description suitable for Gas-Works.

GODDARD, MASSEY, & WARNER'S

IMPROVED

Sulphate of Ammonia Apparatus.

The most successful and approved Apparatus known up to the present time.

FOR REFERENCES, PARTICULARS, TESTIMONIALS, AND PRICES APPLY TO

GODDARD, MASSEY, & WARNER,

ENGINEERS,

NOTTINGHAM.

The Apparatus has been supplied to the following Firms—

BURT BOULTON, & HAYWOOD, SILVERTOWN, and ELING.
CHANCE BROTHERS, OLDBURY (FOUR APPARATUS).
RUNCORN SOAP & ALKALI CO., Limited, RUNCORN.
NETHAM CHEMICAL CO., Limited, BRISTOL.
ANIMAL CHARCOAL CO., Limited SHADWELL.
WM. BUTLER & CO., BRISTOL.
KEMPSON & CO., Pye Bridge.

And to the following Gas Companies and Corporations—

ILKESTON.	BURY.	CHORLEY.
WIDNES.	BRIGHOUSE.	WHITEHAVEN.
HALIFAX.	MARKET HARBRO'	CHESTER.
ALTRINCHAM.	PRESCOT.	SOUTH SHIELDS.
DENTON.	SOWERBY BRIDGE.	LEEK.
ST. ALBANS.	LEICESTER.	IPSWICH.
DUKINFIELD.	DARWEN.	BOURNEMOUTH.
NORTHWICH.	NELSON.	SALFORD.
HUDDERSFIELD.	ORMSKIRK.	LUTON.
		HAMPTON COURT.

R. & J. DEMPSTER, LTD., MANCHESTER.

Telegraphic Address: "SCRUBBER, MANCHESTER."
National Telephone: Nos. 54 and 2296.

London Office: 181, GRESHAM HOUSE, OLD BROAD STREET, E.C.

View of Top of Retort-Bench, containing 484 Mouthpieces, showing Arch and Dip Pipes, Hydraulic and Foul Mains, &c., erected by R. & J. D., Ltd., at the Bradford Road Gas-Works of the Manchester Corporation.

W. PARKINSON & CO.

SQUARE STATION METERS.

All the Meters (which number 14) at the Beckton Station of THE GASLIGHT AND COKE COMPANY have been erected by the above Firm.

PARKINSON'S PATENT EQUILIBRIUM GOVERNORS.

A very large number are now at work; and all Engineers who have adopted them speak in unqualified terms of their great efficiency.

COUNTERBALANCE or AIR VESSEL, as desired.
TWO, FOUR, or SIX COLUMNS and GIRDERS.
WEIGHTS or WATER PRESSURE.

COTTAGE LANE WORKS, CITY ROAD,
LONDON.
Telegraphic Address: "INDEX."

BELL BARN ROAD WORKS,
BIRMINGHAM.
Telegraphic Address: "GAS-METERS."

[See also Advt. p. 28C.

LONDON: Printed by WALTER KING (at the Office of King, Sell, and Railton, Ltd., 12, Gough Square); and published by him at 11, Bolt Court, Fleet Street, in the City of London.—Tuesday, Feb. 9, 1897.